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At Your Service

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can bring new efficiencies
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On his way to work,
Brian started to think
about how changing
applications could
dramatically speed
up product design.

Right after that, a
server overheated
and he spent the day
shopping for fans.

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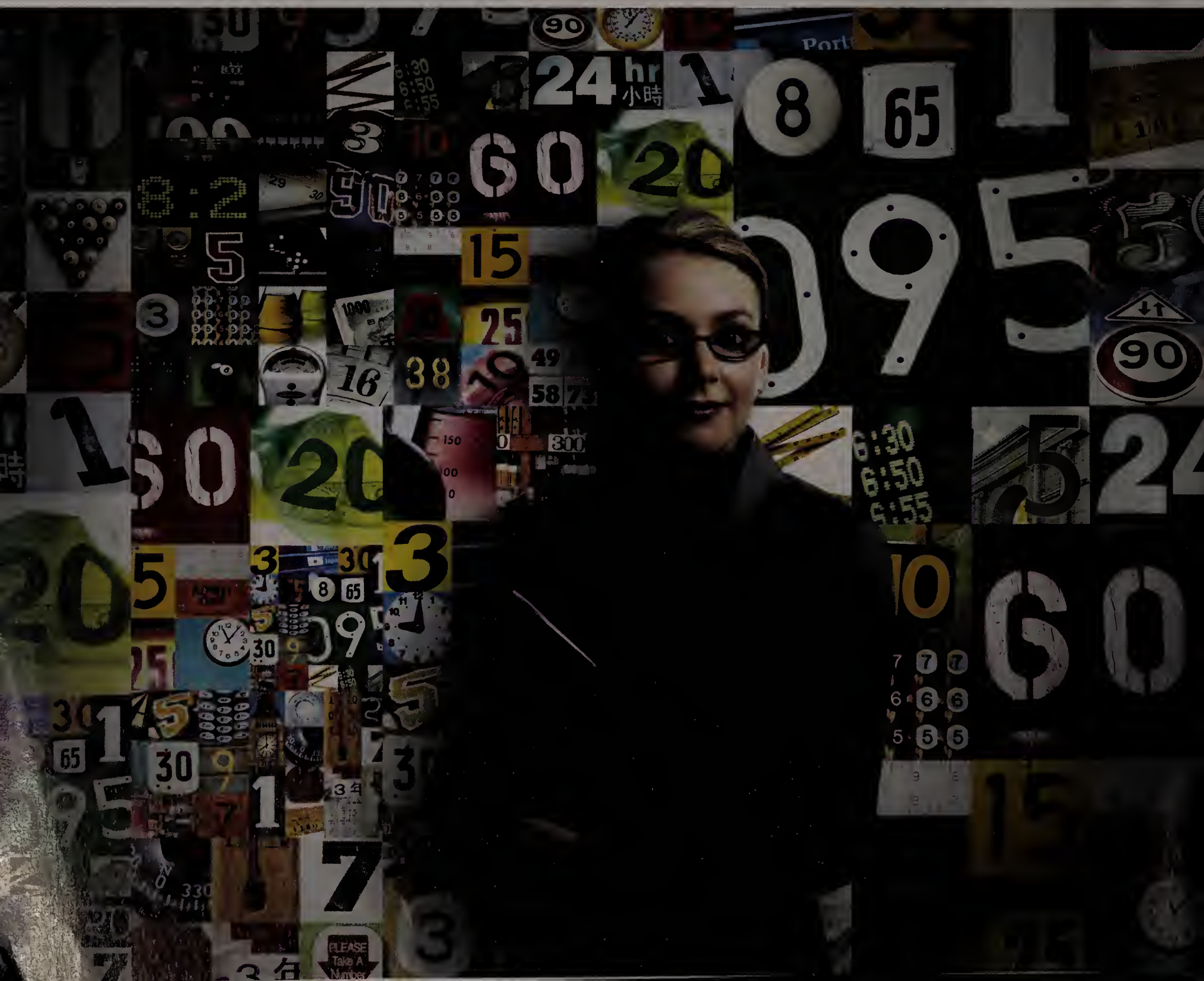


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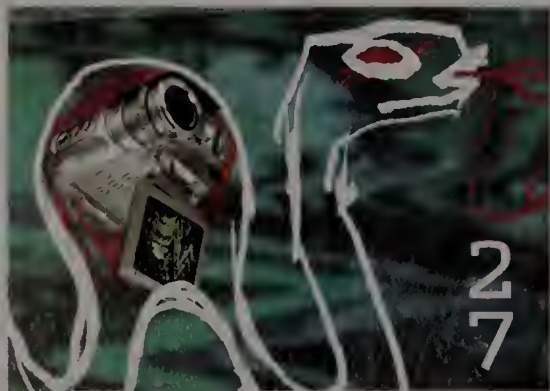
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[ETHICS]

WHEN IS IT OK TO LIE?

A new word has slunk into our vocabulary: *pretexting*. It means misrepresenting yourself. OK, it means lying. Hewlett-Packard



Sarah D. Scalet

CEO Patricia Dunn lost her job because the investigators she engaged to identify a boardroom leaker at HP lied. But wasn't she

entitled to find out? And was she responsible for the methods her investigators used? And is lying itself a crime? CSO columnist Sarah D. Scalet wonders what's black, what's white, and where are the gray areas in her Alarmed security column. Check it out.

www2.cio.com/research/security/edit/a09282006.html



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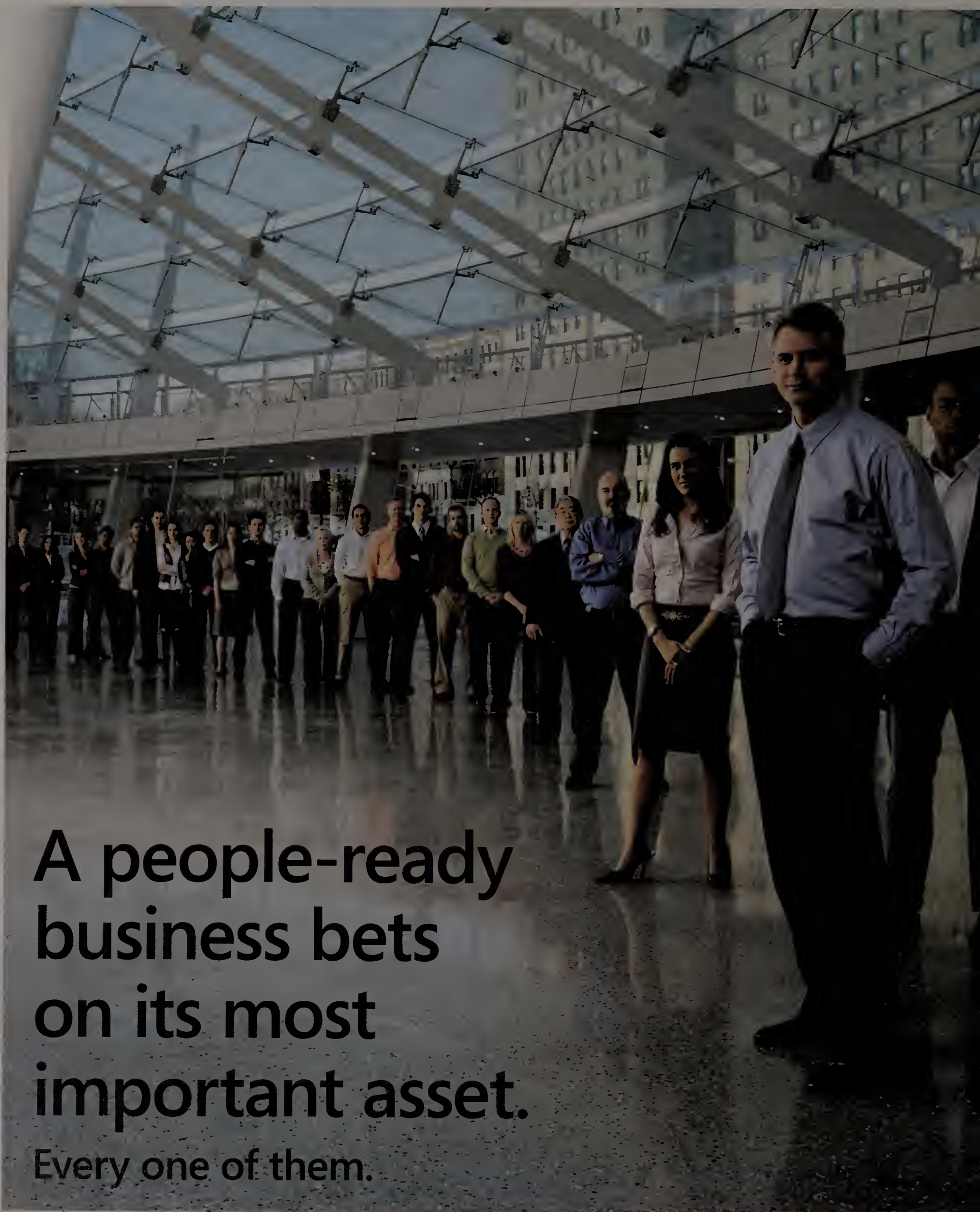
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Step two is to make them ready.

Once you've bet on the culture to deliver, they need tools powerful enough to make it happen. Computers and phones and swivel chairs, sure. But more important is the engine that



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D.I.Y. I.T.

Your users are increasingly determining what IT they'll use and how they'll use it. Does that scare you? It shouldn't.

A few months ago, I was getting a brutal headache reading the hundreds of CIO 100 applications stored in our database. We connect to them through our IE browser, and I couldn't make the teeny-tiny type any bigger. So, as is my habit, I complained to anyone who would listen. And then a writer said, "I can fix that," and it was for him but the work of a moment to download Mozilla's Firefox browser. Voilà! I could make the type as large as I wanted.

So I took a stroll around the office, glancing at people's screens, and I saw some remarkable stuff. Odd looking desktops with odd looking icons. Trillian IM conversations. Gmail and Google desktop search and Weatherfox. FileZilla. Spybot Search & Destroy. Not to mention iTunes everywhere. It's an IT potpourri out there, and it has nothing to do with our IT department. Employees downloaded these apps from the Web because a) they're available, b) they're (mostly) free, c) they're cool, and d) most important, they help them do their jobs better, enabling them to do things that our own enterprise-supplied apps don't let them do, or don't let them do as well.

This is a big deal, and this sea change is the subject of Susannah Patton's story "Consumer Appeal," on Page 63, and Michael Schrage's column, "Digital Subversives," on Page 38.

Once upon a time, the IT you got at work was better than anything you could get yourself. No more. In fact, these days the IT you get in the office frequently looks old-fashioned by comparison. Half of the respondents to a Gartner survey reported that 60 percent of their IT users are employing consumer-grade software in the office whether or not their IT department approves. And some enterprises are responding in a predictable manner, banning unauthorized software and electronics from the office.

Bad idea. You might as well stand by the shore and tell the tide to cease rising.

Not that this trend doesn't generate problems for CIOs. These applications can eat up server space; they can be destabilizing, and those that connect to enterprise systems—such as desktop search—can blow big holes in a company's network security.

But, as Patton and Schrage point out, nobody's going to stop people from using IT that makes their lives easier and allows them to be more productive. Without that Firefox browser, for example, I could not have done as good a job vetting those applications.

The challenge for CIOs will be to learn how to manage IT in this new environment, making it safe and leveraging it for business advantage. Ways to do this are already percolating. Check out Patton's and Schrage's articles to find out what some of these strategies are.

And don't be scared. The IT future belongs to the users, which is how it should be.

David Rosenbaum, Managing Editor
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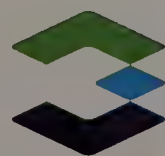
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Power Shift

In a world where every question is multiple choice, business—and the CIO's role—must change



Is your business prepared for the unlimited potential (or extreme threat) of high-speed bandwidth as it achieves massive adoption, leading to a market characterized by a plethora of choices? Signs of the bandwidth upheaval are already appearing. Just look at the music and media industries and I think you'll start to get an idea of what will happen in all markets as power shifts from the producer to the consumer. If you haven't given this much thought, I highly recommend Chris Anderson's latest book, *The*

Long Tail, which explains why the "future of business is selling less of more." He cites eBay, iTunes, Google and Lego as examples of companies that are successfully selling in a market of multitudes.

As Anderson explains, the world is quickly moving from mass to niche, scarcity to abundance, and transactions to interactions. Your customers now have more choices before them than ever before, and the standard ways of interacting with them have been turned upside down. With the Web causing the traditional physical barriers of entry to disappear (both in respect to inventory and geography), we are now facing the opportunity of a lifetime—if we can seize it.

The historic 80/20 rule no longer applies. You no longer have to have 80 percent of your revenue coming from 20 percent of your customers. In today's world, you can drive revenue and profit by aggregating niches that were previously impossible to see let alone serve. As Anderson writes, the "invisible market has turned visible."

If you want to learn more about how almost unlimited bandwidth is transforming the business world, and about other trends that will affect the future role of the CIO, join us at CIO|07, Nov. 5 through 7 at the Wild Horse Pass Resort in Phoenix (www.cio.com/conferences). Chris Anderson and other industry luminaries will be sharing their views on what the future holds for us in a world boiling with change. I look forward to seeing you there.

Michael Friedenber, President and CEO
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InBox



Managing Change

Interesting article ["The New Science of Change," Sept. 15] showing the mechanics behind the processes.

There is an opposite group, of which I am a chief member, where change is the constant and the motivation. Repetition or being comfortable are ideas that drive fear into our souls. The idea of taking the world and turning it on end to watch the results is thrilling. Therefore, we must have a fine-tuned frontal cortex as we prefer to avoid the comfortable. We dissect things, not because they are broken, but because we like to "make it different."

This is a management challenge, as a propensity for change will scare coworkers and can lead to disarray if done in a whimsical manner.

Interestingly, many who reside in this realm possess the "knight in shining armor" mentality. We thrive on saving the day and swinging for the fence. If we dream, we dream big. So we have come to find that pairing one such change-oriented person with someone very reserved and detail-oriented will create a great symbiosis—one constantly looking to improve

through change and the other through standards and maintenance. As the saying goes, "the one constant is change."

DONNY PARROTT

Systems Administrator and Analyst
RM Technologies

Reading this article explains a lot of things I've seen during system implementations, and I'll be a lot wiser next time. Sadly, I doubt the outcome will be much different, because change management is rarely considered, much less funded, and training is bare bones in all but the largest companies.

LINDA MULLER

Senior Systems Analyst

Value Aforethought

R. Ryan Nelson's article ["Tracks in the Snow," Sept. 1] is spot-on when it comes to the need to assess and analyze the real value and success of IT projects—or any projects for that matter—after delivery.

I think we miss the bigger point, however, when we fail to design and plan projects with the end user in mind and involved from the start. The best applications and initiatives are no more than high-ticket wastes if the end user isn't really engaged from the very first thought.

One of the ongoing shortcomings of most IT and technology projects is a lack of proper planning and scoping to determine not just the functional specifications and technical business requirements but the actual requirements as well. Sometimes we get so wrapped up in what technology can do that we fail to ask if it's something that *needs* to be done by the business. Just because we can use VoIP phones and desktop videoconferencing doesn't mean that it's a valid business idea to implement for a small business. Similarly, having one single standardized, integrated computer

system sounds great in theory—but if the users can't make it work (or have to build workarounds to compensate for local conditions), then perhaps the project needed to be planned to compensate for these issues at the start.

We've found that the best question to ask to stimulate this kind of critical thinking is, So what? When my tech director has a vendor come to him with the latest and greatest gadgets and toys, we ask, So what? Will our staff really use fully mobile tablet PCs with wireless? Do we need wireless PDAs with voice, data and Internet to use on projects where much of the data has specific security requirements?

The key then is to ask what the business really needs—not just in tech terms, but in terms of what the users need. If we can get these questions asked properly at the start, we can get more bang for the buck and avoid some of these totally successful projects that are practical failures.

TOM VAN KLEEF

Executive VP
Warren-Goodwin Inc.

I totally agree that project "value" is probably the most important and visible success criteria, but I believe that, unfortunately, value is becoming a buzzword. I suggest that project value must be classified as direct, indirect, infrastructure, strategic or transformational value. Each of these value classifications, in turn, requires a different type of valuation and analysis.

MICHAEL KING

City of Charlottesville

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TECHNOLOGIES

Assault and Batteries

MOBILE The recall of nearly 6 million notebook PC batteries by Dell and Apple in August, and more than 500,000 by Lenovo and 830,000 by Toshiba in September due to fire risk has caused many people to look twice at their computer batteries. However, few alternatives to today's lithium ion batteries exist yet: Promised fuel cell technology for notebooks remains stuck in research labs.

The Dell and Apple recalls, which followed online pictures of flaming Dell laptops, were impressive both for their size and scope. The U.S. Consumer Product Safety Commission called the initial Dell recall the largest consumer electronics recall in history, affecting PCs shipped worldwide.

Sony Energy Tech, which manufactured all the batteries in question, points to problems with cells, several of which are contained in each battery pack. Sony accepts some responsibility and says it will help pay for the recall—which could cost the company up to \$250 million—but the root cause of the problem remains unclear.

Sony points to tiny metallic particles present inside the bat-

Continued on Page 18



IT That Plays Together Stays Together

TALENT Don't tell the U.S. Department of the Treasury, but Bahman Koohestani, the CIO of Orbitz, has created his own currency. He calls his cash Bahman Bucks, and the roughly 300 members of his IT department based at Orbitz's Chicago headquarters use it at a restaurant across the street from their office, and soon will use it for IT group outings to concerts and sporting events.

Koohestani created the currency, which managers distribute to staff before

a social event, to encourage members of his IT department to hang out after work. "The business that plays together works better together," he says.

Indeed, "Socializing outside of work may help resolve conflicts and build trust," says Thomas Harvey, author of *Building Teams, Building People*.

The teams that play together also stay together. Koohestani says Orbitz's IT turnover is low, partly because employees don't want to leave their coworker friends. He notes that the social activities

he sponsors, which typically cost Orbitz between \$1,600 and \$2,000 per event, have also helped him recruit new talent.

"It is significantly cheaper for us to increase our productivity and do something about retention than recruit new people [due to turnover]," says Koohestani. "The type of work we do and the competitive market we're in requires an extra level of connectedness you don't get from coming to work every day and punching out at the end of a shift."

—Meridith Levinson

Microsoft Zune: Doesn't Sound Sweet to Everyone

PRODUCT NAMES Microsoft's forthcoming digital music player, dubbed Zune, may make some Hebrew speakers gasp. The name for the device—which will take on the Apple iPod when released later this year—sounds like a vulgarity, specifically the “f” word, in Hebrew.

The tech industry continually creates goofy product names, exemplified by Yahoo and Google. But companies routinely hire branding consultancies to extensively research product names, including translations in other languages, says Steve Manning, managing director for Igor International in San Francisco, a branding agency. Nobody wants to make the mistake that Chevy did with its Nova automobile (*No va*, of course, made Spanish speakers think “no go.”)

Hebrew linguists are divided over Zune. Tsila Ratner, the head of Hebrew courses in the Department of Hebrew and Jewish Studies at University College London, says Zune is an unsuitable name for a product. However, Haggit Inbar-Littas, a 30-year veteran Hebrew teacher with the London Jewish Cultural Center, says while the name is “ridiculous” and close to the bad word, it's unlikely to be mistaken.

Microsoft breaks the controversy down to pronunciation. “While we do acknowledge the similarity in pronunciation to Hebrew *zi-yun*, that is not the intended meaning of the name Zune,” according to a Microsoft statement. Bloggers have picked up on the difference—

one humorously writing that if you say Zune to rhyme with iTunes, out pops the profanity.

—Jeremy Kirk



TREAT ME RIGHT

CUSTOMER CARE The Customer Respect Group annually asks consumers which of the 100 largest U.S. companies treat online customers best—considering website usability, quality and timeliness of e-mail communications, and trustworthiness with personal data. 2006 winners: **HIGHEST RATED OVERALL:** Intel, Sears Roebuck, Hewlett-Packard, Medco and Procter & Gamble. **PROBLEM AREA:** Only 13 companies consistently send helpful customer replies within 24 hours.

Batteries

Continued from Page 17

teries after manufacturing. If those particles punctured a cell wall, they could cause a short circuit and thus a fire, the company says.

“You try to eliminate that in the manufacturing process, but to eliminate them 100 percent is very difficult,” says Rick Clancy, a spokesman for Sony. “Usually when you have a short circuit, it might lead to a battery powering down, so you’d have a dead battery, but other times it could lead to incidents including flaming.”

The troubles prompted the IPC (a trade association representing component makers) to begin work in September on a new industry standard for lithium ion battery production and quality control. Dell, Hewlett-Packard, Lenovo and Polycom, among others, are helping craft the standard.

“Our message is that public safety comes first,” says Tony Corkell, quality and standards executive at Lenovo. The group aims to publish the standard by the second quarter of 2007.

The recalls have also prompted the question, is there a better alternative to lithium ion? Not right now, but maybe in a few years. Vendors such as Panasonic and Casio continue to research fuel cell technology.

Panasonic still claims lithium ion is a “very good technology” but is also working on fuel cells, says Brian Kimberlin, director of consumer marketing at Panasonic Battery Corp. of America.

Fuel cells can typically keep a PC running for several hours on a small squirt of methanol. Earlier this year in Tokyo, Casio demonstrated a fuel cell for notebook PCs, early versions of which the company said would ship in 2007. Casio claims the prototype could work about four times longer than a comparably sized lithium ion battery.

Many laptop makers are pursuing the technology, but it remains too immature for commercialization. Also, the airline industry has yet to approve fuel cells for use aboard planes. Despite earlier predictions by some laptop vendors that fuel cell-powered machines would be on sale by now, they remain a year or more away from shipping.

—Martyn Williams

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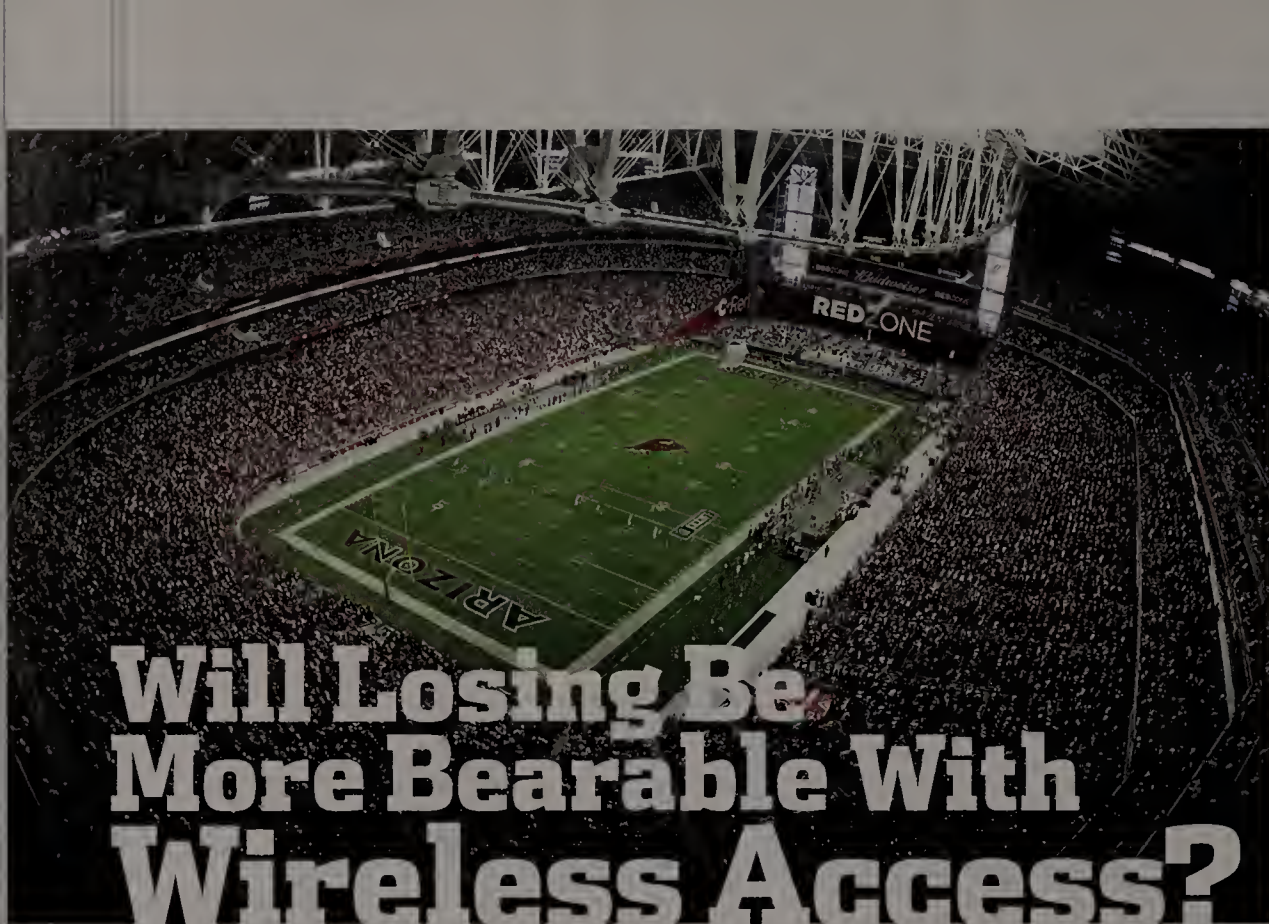


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Will Losing Be More Bearable With Wireless Access?

WIRELESS Will one of the most high-tech football stadiums in the country help the hapless Arizona Cardinals give fans more victories? Time will tell, but the new \$450 million Cardinals Stadium will give fans access to 700 high-definition televisions and wireless Internet service in 95 percent of the stadium.

The Cardinals, together with technology partner Insight Enterprises, have shown how even a team with a small IT department (in this case, just four IT staffers) can create one of the most customer-friendly U.S. sporting venues via

ubiquitous wireless access.

"[The Cardinals'] client is the fan," says Steve Kedzior, senior vice president of Insight's Client Solutions. "We had to look at it from their perspective. How can technology improve the fan experience?"

The wireless network, along with more than 800 IP phones, should help Cardinals employees process ticket sales quickly. The flat screens let fans keep watching the game while buying food from vendors and enable the Cardinals marketing department to advertise for

« The new \$450 million Cardinals Stadium in Phoenix gives the team's long-suffering fans wireless Net access and its coaches slick tech tools.

upcoming games, events and conferences.

Event planners will be able to tap into the stadium's large show floor with more than 1,000 IP drops. That floor lives underneath the stadium's football field, which is installed on a unique, retractable 12 million-pound tray that keeps the grass outside until game day for maximum sun exposure, then gets rolled in.

The new converged wireless and wired network for data and IP voice, which spans the stadium and the team's satellite practice and training facilities, helps the Cardinals IT team slice, dice and deliver new data to coaches as needed during games.

"They watch so many hours of video, and it's all digitized now," says Mark Keller, senior technology director for the Cardinals. "It's delivered to coaches on their laptop over our backbone."

Many people will get their first peek at the stadium during the team's first Monday Night Football game on Oct. 16; it will also host the 2008 NFL Super Bowl.

—C.G. Lynch

Where Outsourcing Is Academic

INNOVATION Almost every CIO grapples with the question of how much to outsource. John Bielec, CIO of Drexel University, helps CIOs answer that question—and in doing so, drives new revenue for the school. Drexel now serves as an IT outsourcer (for example, delivering course management software and SAP academic software) to approximately 50 colleges in the United States and United Kingdom.

The program gives small

colleges (typically those with 2,000 students or fewer) access to the IT resources, processes and services of a larger university—including Drexel's data center and access to the 2GB Internet2 research network. For four of the colleges, Drexel's Office of Information Resources and Technology runs the whole IT show, from course registration to payroll.

"Our arrangement is flexible," Bielec says. "The university presidents have access

to me by cell phone. I'm their CIO in many ways."

The idea emerged in the late '90s, when Drexel took over the largest private medical school in the United States and ported its own systems to the acquired organization using an ASP model. This gave Drexel's president, Constantine Papadakis, the idea to outsource Drexel's IT expertise and drive new income, Bielec says.

Drexel has tapped into a growing need. Of the 3,500

U.S. colleges and universities, half have 2,000 or fewer students. These schools need to deliver an increasing variety of technologies to keep attracting students, but they can't afford constant investment in new systems.

Meanwhile, Drexel, with more than 15,000 undergraduates, uses the outsourcing fees to keep its IT costs steady. Income from external partners has increased 400 percent since fiscal year 2003, Bielec says. The effort now funds 27 percent of Drexel's central IT costs.

—Laurianne McLaughlin

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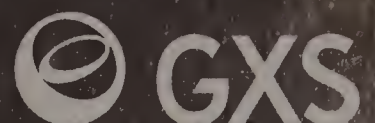
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California May Mandate Wi-Fi Warnings

WI-FI Smart move or silly warning? That's up for debate:

The California Legislature has asked Wi-Fi equipment makers to warn buyers of wireless LAN access points that strangers can tap into a wireless network that isn't password-protected.

A bill passed by the state Senate in August and slated to become effective in January

would require any wireless access point for homes or small businesses to come with a warning. It could be a

sticker or a page in the configuration software, for example, but the buyer must be forced to look at the warning before using the device. At press time, the bill had not reached Gov. Arnold Schwarzenegger but was expected to earn his approval.

"There needs to be a level of education and understanding out there about just how easy it is to access one of these systems," says Richard Stapler, spokesman for Assemblyman Fabian Núñez, who introduced the bill.

However, some analysts have pounced on the effort, which applies to products made after Oct. 1, 2007, as an unnecessary state regulation.

"To get the state involved with this is ridiculous," says Gartner Group analyst Ken Dulaney. "Don't they have anything better to do?"

Dulaney says anyone using a wireless LAN should know someone else could tap into it, just as people buying a car should know they could get in a crash. And setup wizards for most wireless LAN products already address security, he says.

"It's one more crazy tax on suppliers" that ultimately will be passed on to consumers, he adds.

As for CIOs whose employees use wireless access points to reach the enterprise network from home, they should already assume that any network their employees use outside the office is unsecured, and make using a virtual private network mandatory, Dulaney says.

—Stephen Lawson

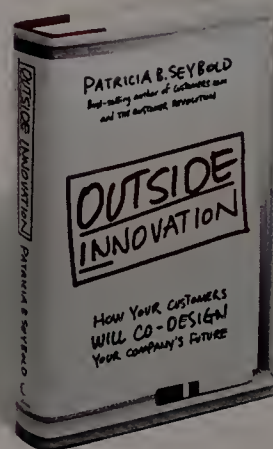


Could Customers Be Your Best Innovators?

BOOK REVIEW Many dotcom-era business plans based on "virtual community" crashed and burned. But some companies today have discovered that online communities for customers not only provide business value but also become a critical component of their customer relations, R&D and marketing efforts. That's one key piece of consultant Patricia Seybold's new book, *Outside Innovation*, which posits that companies need to engage customers in more innovative

ways to help redesign products, improve processes and test business models.

The author of *Customers.com* and *The Customer Revolution* goes into great detail—using dozens of case studies from heavyweights such as Staples and Kraft, and lesser-knowns such as Koko Fitness—to get executives to wake up to her main point: The traditional company-customer relationship ("We develop products for our customers") has flipped, and



Outside Innovation: How Your Customers Will Co-Design Your Company's Future

Patricia B. Seybold
Collins, 2006, \$26.95

Seybold's examples are noteworthy for their innovations and financial returns.

Of course, companies can't handpick customers, especially ones who want to strut their stuff for the company, so it'll take a lot of work to vet the good from the bad, hammer out the relationship details and find suitable rewards for customers' efforts. Much more work, it seems, than many firms are willing to put forth, Seybold says.

—Thomas Wailgum

those who ignore this reality do so at their own peril.

This line of thinking requires a level of openness simply not found in many enterprises today—a faith that customers' passion for your products and services will translate into revolutionary product developments and efficiency for you. In a sense, it's R&D on the cheap.

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by the numbers

BY DIANN DANIEL

Mobile Mayhem

CIOs struggle to centralize device control

THE USE OF mobile devices like PDAs and Web-enabled cell phones continues to rise, but CIOs' control of them does not, according to a recent survey of 319 companies by The Yankee Group. The current lack of control hampers device management, obscures enterprise-wide usage trends and inflates cost per device, analysts say. CIOs will continue to struggle to centralize purchasing and management, but this is a battle you want to keep fighting, says Yankee Group analyst Nathan Dyer.

CIOs need to lay the foundation for how more devices and greater integration will be handled in an overall mobile strategy, Dyer says.

The Yankee survey found that 40 percent of today's workforce is mobile, defined as spending at least 20 percent of their time away from the primary work space. Almost half of mobile workers use multiple devices. Twenty-seven percent use smart cell phones, 68 percent use traditional or dual-mode cell phones, 48 percent use PDAs, and 89 percent use notebook PCs.

Many of those devices are outside the CIO's purview. "Notebooks have been under IT control for years now," says Dyer. However, just 38 percent of the mobile workforce has company-issued mobile devices other than notebooks. Companies would like to boost that

figure to 58 percent within three years, the survey stated.

Today, many companies still have limited control over, or even visibility into, just who has mobile devices and how they use them. Since many users choose their own devices and expense the service costs, IT does not get to negotiate discounts, gather peak usage data or control security.

The survey also investigated barriers to deploying mobile data services, such as mobile e-mail, CRM and asset-tracking applications. Top concerns include: data and network security, complexity of integrating different applications and data sources, and device management.

Best Practices

1. Survey mobile device use. Find out who's using which devices in your company and how they are bought. This data will help you craft a comprehensive policy to cover purchasing and usage guidelines, device disposal and incident reporting.

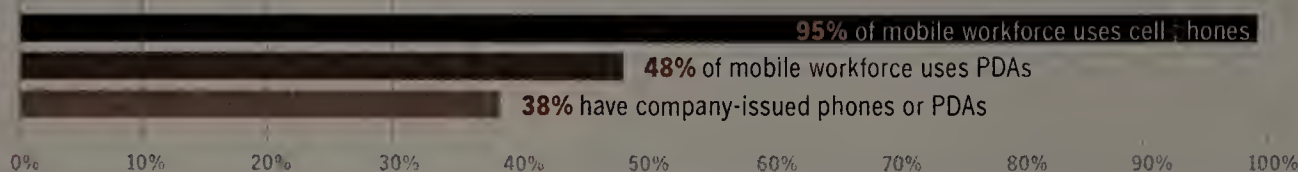
2. Create a forward-looking mobile strategy. Most companies still craft mobile device purchasing rules to address a specific set of workers' needs or a specific business application, says Nathan Dyer, a Yankee Group analyst. Look beyond voice and determine what technologies it will take to support Web application integration.

3. Consider outsourcing mobile device management. Vendors such as AT&T, Mindwireless, Movero, Sprint and Traq Wireless on the voice side, and EDS, Hewlett-Packard, IBM and Sprint on the hybrid voice and data side, can provide analytics, support services, strategies for reusing devices, and the ability to remotely "kill" stolen or lost devices.

MOST WANTED: MORE CONTROL, BETTER SECURITY

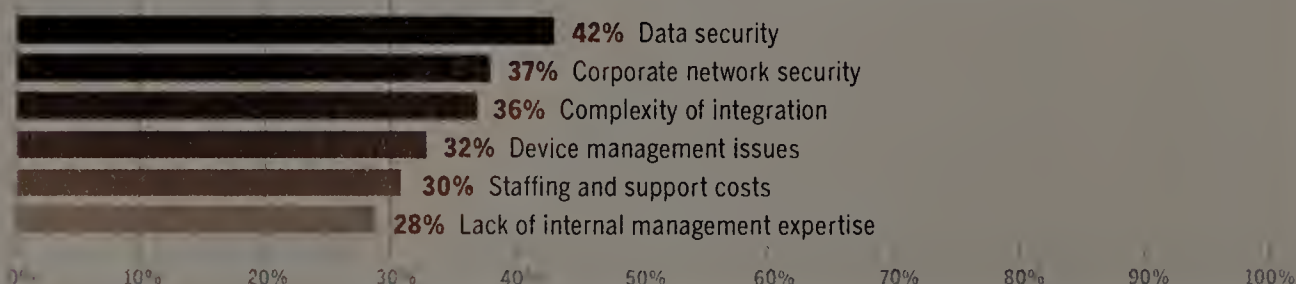
Most Phones, PDAs Are Outside IT's Domain

While cell phone and PDA use is widespread, CIOs purchase and control less than half of these devices



Big Worries About Mobile Data Services

Top security and management concerns for deploying apps like mobile e-mail or mobile CRM



SOURCE: The Yankee Group

NEW AGE INFORMATION MANAGEMENT: Utilizing Backup and Archiving the Right Way

As business requirements change, backup and archival technologies have evolved to meet them.

It used to be enough to back up and store data off-site—the information was there for recovery in case of emergency or disaster.

But times have changed, as emerging new regulations increasingly affect how companies store and retrieve their data. Regulations such as HIPAA and SEC Rule 17a-3 and 17a-4 specify the type and length of time some data must be stored, while mandates such as SOX and Basel II require stricter controls on how information is managed. Meanwhile, legislation such as Gramm-Leach-Bliley Act, FACTA, and local state breach notification statutes continue to up the ante around information privacy and security—a requirement that is only reinforced by the increase in malicious activity worldwide. Moreover, the legal sector is requesting more and more electronic information as part of the legal discovery process, meaning that companies must be able to retrieve information quickly at an increasingly detailed level.

“Information management requirements have dramatically changed over the past five or six years,” says Brian Babineau, an analyst at Enterprise Strategy Group, an IT analysis and research company in Milford, Mass.

But traditional methods of storing data have not. Many companies’ current storage strategies depend on traditional systems such as tape backup as an archiving method, with the thinking that the data was rarely needed and accessed—a strategy that does not mesh with these informational changes.

“Until recently, business operations did not require the accessibility and availability of historical data,” says Babineau, “and institutionally, many companies have not realized that their

processes are out of step with today’s business requirements.”

But today, the two processes serve very different needs. Data backup, in which information is copied and stored off-site daily as a protective factor, is designed to protect against short-term data loss, such as accidental deletion, device failure, and data corruption.

Archiving, on the other hand, is the long-term storage and retention of a point-in-time copy of information for a specific business purpose. That kind of retrieval needs to be fairly granular—for example, as required by legal discovery purposes.

And as the need to retrieve information becomes more fre-



quent, companies are finding that using backup as an archival mechanism is both time-consuming and costly. Faced with this reality, leading CIOs are beginning to treat backup and archiving of information as separate processes. “Companies are starting to realize the benefits of having two distinct processes to solve different business requirements,” says Babineau. “One process is about what happens if you lose data, while the other is about what happens when you need to find information.”

ARCHIVAL BUSINESS REQUIREMENTS

CIOs should start separating these processes by defining and analyzing the new business requirements behind data archiving. By doing so, they can start building a strategy that fully answers both backup and archival challenges. Some of the big issues include:

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“Many people think that if you introduce archiving you have to change everything, but the reality is that you don’t.” —Brian Babineau, Enterprise Strategy Group

- **ELECTRONIC DISCOVERY.** Backup technology usually does not index information at a very detailed level, making it difficult to search for specific records based on granular content. Archiving technology will index information at a far more granular level. When it comes to legal discovery, companies may field requests to find individual emails sent by a particular person on a specific day. In these cases, archiving technology’s ability to quickly search and retrieve individual files is a huge benefit, particularly since companies that cannot comply with discovery requests can face stiff fines.
- **COMPLIANCE ISSUES.** Many companies are required to retain specific electronic business records, certify that they remain unchanged, and make sure that proper controls are in place to guarantee the integrity of such data. Archiving technologies, which can remove inactive data from production systems and keep that data accessible on lower-cost storage media, are a good fit for this.
- **INCREASED EFFICIENCY.** Pulling non-transactional data from production systems means that CIOs have to back up and save less production data. “If you archive that file, you’re not backing it up, and that’s where efficiencies are gained,” says Babineau. Result: More efficient storage management.

Newer, high-retrieval archive systems allow CIOs to easily index and search information, as well as assign archival requirements as the data is created. “The ability to classify information is probably one of the most important technology trends we have,” says Babineau. “It gives us insights we haven’t had before, and depending on archival requirements can align data across appropriate levels of storage.”

Archival technology can also improve storage resource utilization by matching the accessibility and availability requirements of archived data with the appropriate level of storage. Data that is regularly subject to possible legal discovery or compliance audits should be protected using technology that stores it in way that makes it indexed, searchable and easily retrievable. Data, not typically subject to legal and compliance requests, can be stored more cost-effectively using traditional methods like tape and protecting it off-site.

WHAT SHOULD BE ARCHIVED?

In general, information that is not going to change, but must be retained for legal, general business, or regulatory purposes. Next, “Take what you have to archive and identify the sources of information that create that type of information,” says Babineau. E-mail, which contains a vital record of much ongoing business, is the most popular archival candidate, but databases and application files are also good sources. “A lot of data in databases is not going to change—it’s write once and

read many times in the future, and it doesn’t need to be on the primary financial application system,” says Babineau. Similarly, many application files also contain information that hasn’t changed in years, and would work well with archival technology. CIOs should then assess their technical ability to properly archive this information. What’s the retrieval frequency, and how quickly must it be retrieved? How long must it be retained? How will the information be organized and classified? These questions will help CIOs choose the proper archival method—or a service provider trained in archival technologies. Other considerations include the value of the data to be archived, and the financial ramifications of not archiving the appropriate data the right way.

RESULTS

By creating separate backup and archival processes that work in tandem, CIOs can maximize their success with both mechanisms. Transactional or changing data will continue to be protected through backup technology, but the process will be streamlined as non-transactional data shifts to archival.

“Many people think that if you introduce archiving you have to change everything, but the reality is that you don’t—archiving augments the backup process by archiving old data first. Then companies back up only what’s most recently changed,” says Babineau. Optimally, the archive system becomes another object in the backup process, and archived data is backed up as new data is added. “The only thing that archival does to backup processes is to add another system target to be backed up infrequently,” he says. Meanwhile, companies can take advantage of archiving technology’s classification and retrieval capabilities to ensure legal and regulatory compliance.

By separating the two processes and building a strategy that emphasizes the strengths of each, CIOs can best support the changing business world around them. “As business operations respond to change, the influences driving information management have also altered,” says Babineau. “Building an integrated backup and archival strategy lets CIOs support and meet these new challenges.” •



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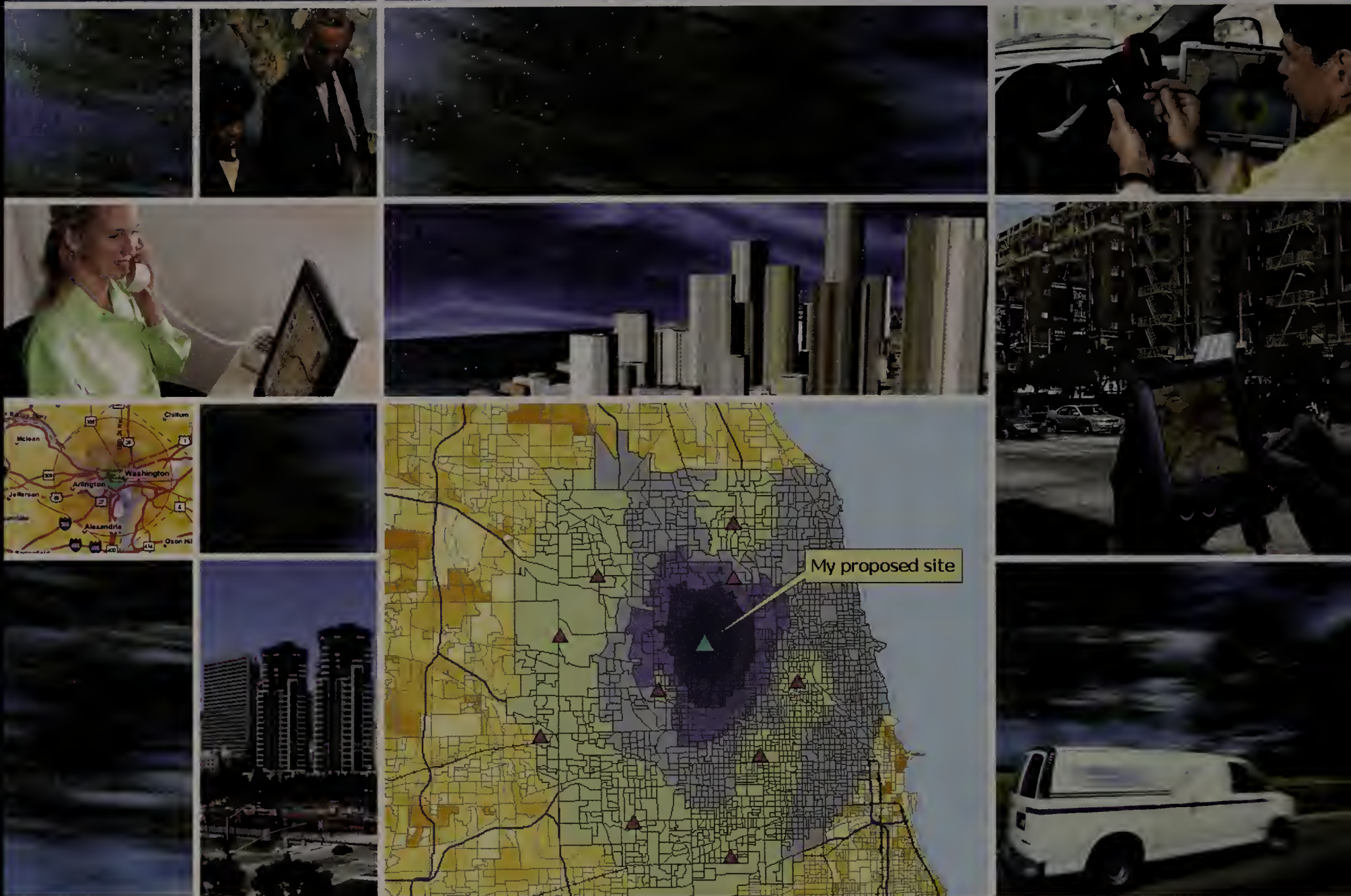


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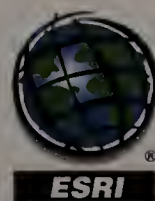
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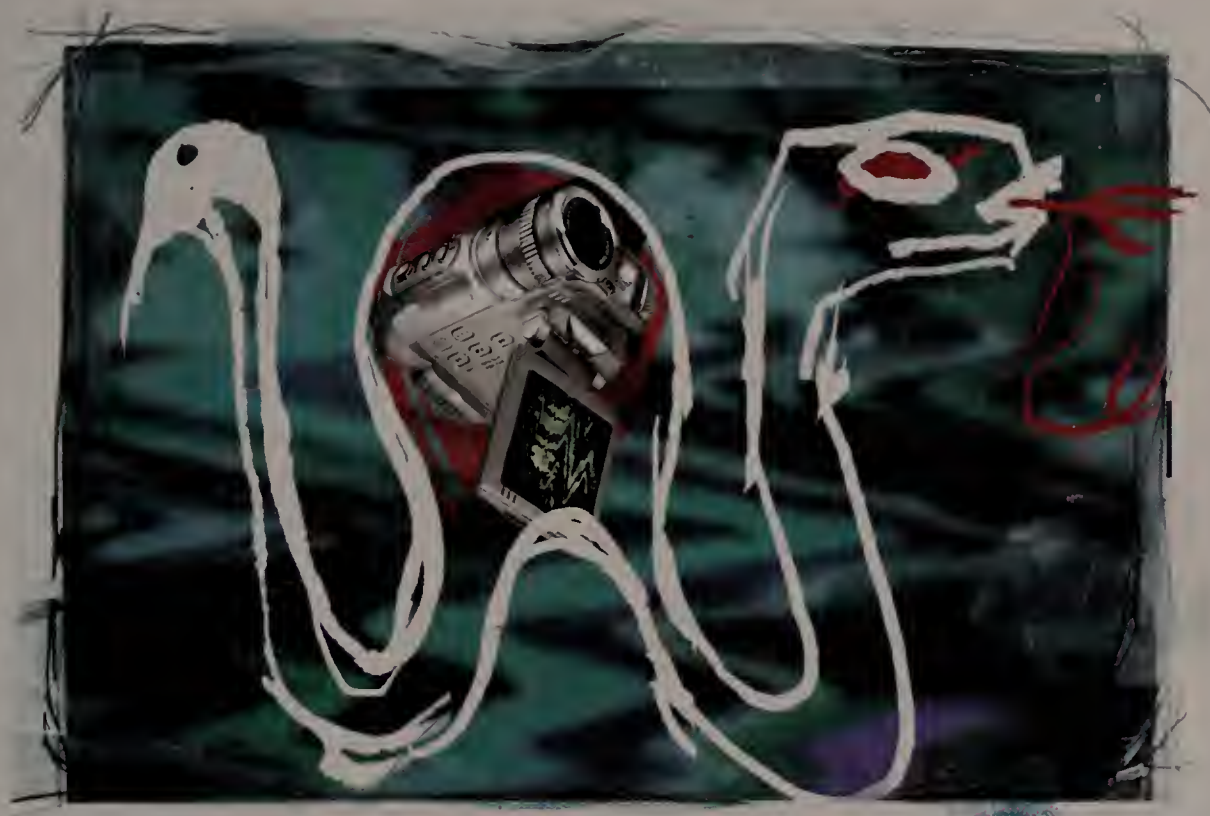
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ESSENTIAL

FROM INCEPTION TO IMPLEMENTATION—I.T. THAT MATTERS

technology



Streaming video clips are invading your network. Get a grip now or deal with the pain later.

Video Bellyaches

BY LAURIANNE MCLAUGHLIN

VIDEO | Every single day, according to Web phenom YouTube, people watch more than 1 million streamed video clips on the site.

Do you know how many your employees watch? You should. The soaring popularity of Web video can expose your company to bandwidth problems and other trouble if you don't manage it wisely.

More video—both recreational and business-related—now eats up your network's bandwidth than ever before thanks to several converging trends. In addition to YouTube, a growing pool of video on news and sports sites like CNN and ESPN tempts employees to dive in at work. Advertising companies push clever viral video clips to promote products from sports drinks to movies. Low-cost video cameras and editing software encourage people to produce family vacation blockbusters and share them online with friends and colleagues. On a different (and more legitimate) note, companies increasingly use video for employee training. (Video training costs less than in-person training, especially for companies with multiple, far-flung offices, and can help verticals such as the food services industry satisfy regulatory training requirements.) And as companies offer more and more video on customer-oriented websites, their own employees must review that video

over the WAN.

The problem is this: Your enterprise network is a pipe that has just so much bandwidth, and if streamed video consumes too much of that pipe at once, applications run slowly and documents take a long time to open. These situations, of course, can prevent critical business from getting done expeditiously and prompt the dreaded question: What's going on with the network? IT needs to get a handle on video before it degrades the enterprise's ability to conduct its business. Yet industry research shows many

Stock Car Auto Racing (Nascar). "We post a lot of video clips on the Intranet."

As Nascar.com and its partners deliver ever more race highlights and driver interviews to fans, Worling's employees must review them, which means they work with more video every day over the network. And all that video traffic must compete with the other apps on the WAN for bandwidth. Consequently, "We're seeing those pipes get more congested," Worling says. His peers in industries like travel and entertainment see a similar situation developing as their companies offer

"Two years ago, we weren't doing what we're doing now with video. The pipes are getting congested."

—Steve Worling, Nascar manager of IT infrastructure

CIOs have not done the baseline analysis to understand how much of the overall pipe is being taken up by video, business apps, regular Web browsing and other sneaky bandwidth-eaters like Skype.

Flatly ordering employees not to watch streamed sports coverage while at work may or may not be part of your bandwidth management plan; that depends on lots of factors including your corporate culture. But now's the time to explore strategies and tools to better manage video.

Nobody Wants a Video Clog

As a CIO, maybe you're tempted to say, "There's an easy answer to video pollution. From now on, there won't be any streaming video on my network. End of problem." But at a growing number of enterprises, it's impossible to deny employees access to video. They need it to do their jobs. And once your company starts working with video, you may be surprised how quickly the amount of it grows, CIOs say.

"Two years ago, we weren't doing one-third of what we're doing now with video," says Steve Worling, manager of IT infrastructure for the National Association for

up more video to consumers, and their employees spend more time working with that video over the WAN.

At Nascar, Worling's bandwidth woes are compounded by the fact that in certain departments like legal, users send a lot of large documents between offices on the WAN, taking up another big slice of the pipe. One result: Those users saw it taking longer to trade and open those important documents, says Worling. So now one of his priorities is to tackle the bandwidth problem.

Analyze This!

As an IT department tackles video, it faces several options: Block streaming video entirely, set defined limits or use a "dimmer switch" approach to ensure that critical apps get bandwidth first. To make sure employees understand the rules about video use, you'll want to update your company's Internet use policy. (For advice on how to do this, see "Your Internet Use Policy," this page.) You may also need network appliances to help manage video, or a bigger Internet pipe. But the first item on your to-do list must be analysis.

Your Internet Use Policy

Employees need to understand the rules

HOW CAN YOU construct a solid policy? Here are some key tips:

1. Get HR involved. IT should list the technologies to be mentioned in the policy, and HR should ensure the rules are explained in layman's terms, says Jennifer Bermian, a managing director with CBIZ Human Capital Services, a business services firm.

2. Be clear and specific. "Use real examples of what's permissible," Bermian says. Address online shopping, sports scores, streaming video. The more specific, the better, she says. The policy templates she provides to clients increasingly mention new technology such as video, social networking and IM.

3. Understand that video can fuel hostile workspace claims. There are "inappropriate videos" on sites such as YouTube, says Scott Fisher, an attorney at law firm Fowler White Boggs Banker, that could lead to discrimination, harassment and hostile workplace suits filed against companies that have allowed those videos to come into the enterprise.

4. Make avenues for complaints clear. Employees must understand how to report violations, Fisher says. And managers need training on how to deal with violators, says Bermian.

5. Review policies at least yearly. "There's so much in this arena that takes place in a year. You want to make sure your policy covers a new situation or device," Fisher says.

—L.M.

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Take a close look at what's lurking on the WAN. Companies already use Web filtering technology to block offensive sites and monitor employee surfing, but it's surprising how few have taken a cold hard look at bandwidth utilization on the WAN down to the level of specific apps and sites, says Forrester Research Senior Analyst Robert Whiteley. You need to understand which applications take what percentage of your overall bandwidth pipe, Whiteley says.

For instance, you want to know if employee visits to YouTube are taking 10 percent of that overall pipe, because you might need to make that bandwidth available for business apps—say the new Web apps you're rolling out as part of your SOA strategy.

"It's amazing how little quality-of-service research is done," Whiteley says, to ensure that the apps that are most important to the business get the necessary amount of bandwidth to keep them humming. Just 11 percent to 13 percent of IT organizations analyze bandwidth usage down to the detail of individual applications, according to Forrester.

Companies such as Cisco, Expand and Packeteer have long offered band-

width management products, such as Cisco's WAN optimization hardware and software solutions, which can help you monitor and manage bandwidth allocation. But now they are addressing the video trend. Cisco offers software that gets added to its WAE appliances or its widely deployed Integrated Services Routers to specifically manage bandwidth problems related to video. The software, according to Cisco, will compress and cache the video (so it doesn't travel repeatedly over the WAN) and eliminate unnecessary "chattiness"

Tool Talk

A new breed of appliances from companies such as Blue Coat offer caching and compression, plus the ability to ensure oversight of all video traffic and then simplify that oversight. These boxes, which usually live at the Internet gateway on the network, offer a wide variety of rules and policies that can be applied and managed. Blue Coat's SG appliances give you the option of blocking all streaming video, video from specific sites or just from parts of sites. (For instance, you might allow CNNMoney but not CNN SI.) Or you can choose to block all streaming sites except a specific group during business hours.

Then there's the dimmer switch approach: letting streaming video take only a certain percentage of your overall bandwidth—after that, users will have to live with slower video.

In the future, says Joe Skorupa, a Gartner research VP, CIOs can expect to see more multifunction WAN appliances that will handle caching, compression, application performance monitoring, block-

ing, security and maybe VPN tasks.

Another reason to consider an appliance is if your company has centralized servers to simplify Sarbanes-Oxley compliance by putting all backup data in one location. In that case your users are now sending more and more data over the WAN rather than grabbing it from a local server. This can cause documents or apps to slow down.

Nascar's Worling, who experienced just this problem, is adding bandwidth optimization appliances from Juniper to Nascar's network (Juniper's WXC 500

19%
of Americans
—about 47M
people—
have viewed
Internet video
in the past
month; **12%**
have done so
in the past
week.

SOURCE: Arbitron/Edison Media Research

and WXC 250 models). But that change alone won't be enough to address Nascar's needs. If you have a large amount of business-related video traffic, an appliance will often help, but you may also need to upgrade your Internet pipes.

Time for a Bigger Pipe?

In some cases, setting rules with users and implementing network appliances will give you adequate control over the video situation. But for companies with heavy video consumers, you may also decide you need a better Internet connection.

Nascar came to this conclusion and recently installed a 20Mb Internet connection, replacing a 3Mb T1 in its Daytona office at about the same monthly cost. (Nascar's provider, Brighthouse, brings fiber right to the building and offers competitive rates.) Nascar currently has a 5Mb connection in its Concord, N.C., office and is looking for alternatives to T1 for its other offices in Charlotte, N.C., New York City and Los Angeles.

Later this year, Worling will also deploy

Hackers are writing spyware and virus code to work with IM, VoIP and software used to view video.

width management products, such as Cisco's WAN optimization hardware and software solutions, which can help you monitor and manage bandwidth allocation. But now they are addressing the video trend. Cisco offers software that gets added to its WAE appliances or its widely deployed Integrated Services Routers to specifically manage bandwidth problems related to video. The software, according to Cisco, will compress and cache the video (so it doesn't travel repeatedly over the WAN) and eliminate unnecessary "chattiness"

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multiprotocol label switching (MPLS) network infrastructure to tie offices together with 1.54Mbps data connections.

"[MPLS] will allow all the offices to talk to each other without routing through one central point like the Daytona office," Worling says. "We currently share point-to-point T1s that point back to the Daytona office with our voice applications." With the MPLS design, data from branch offices won't have to travel back and forth to Daytona as much, which improves the WAN bandwidth picture.

Still not convinced you need to change the way you manage video? Well, clogged pipes and lethargic apps are not the only problems the video explosion is introducing to the enterprise. Does the word *storage* get your attention? How about *security*?

Wait...It Gets Worse

As companies create more video, IT must store it. And video files aren't small. Worling must store a growing amount of video that Nascar uses to do crash analysis. His storage requirements and costs are rising, so he must get more efficient. "We just bought a SAN and are consolidating some storage," Worling says.

At Purdue University, Interim VP for Information Technology and CIO Gerry McCartney says it's hard to forecast the video clip volume on the network in the next few years, and this complicates his storage planning.

"We're seeing an increase in e-mail storage, and we attribute part of that to videos sent via e-mail," he says. Purdue students currently get a storage limit of 500MB (after that they must clean out their mailboxes), but the college may increase that limit to 1GB, partly due to the video factor,

he says. That means Purdue's e-mail servers require more storage.

The university is also having to increase storage due to video training that it's using to teach employees ERP applications, McCartney says.

And in addition to storage, security could become a video-related headache for CIOs, says Forrester's Whiteley.

Today's hackers are writing small, nimble pieces of spyware and virus code that they can quickly modify to work with various types of programs, including IM, VoIP or the player software that people use to view video clips, Whiteley says. Right now, the risk is theoretical, he says, but should be on a CIO's radar.

In one of the first examples of malicious code being delivered via video tools, antispayware vendor Webroot reported in August that it located a Trojan horse program called Zlob, pretending to be an update to Windows Media Player. Users clicking on video clips were asked to download the update, which included the Zlob malware, and it proceeded to seek out other malware to install on those PCs, according to Webroot. The problem with malware like this is you typically don't know what the intent of the virus writers is—to install "bot" software to control the PC, to look for data on your network or just to cause mischief.

Bottom line: CIOs will need to watch how the amount of video on the network evolves and be prepared to change the rules accordingly, says Matthew Miszewski, CIO of Wisconsin. "Our normal Web filter blocks inappropriate traffic," he says, but he hasn't had to make a move like forbidding ESPN during business hours for bandwidth reasons. "We've thought about it," he says. "But I don't think it would be a popular move. If it gets out of hand, we have the ability to lock it down."

Do you? **CIO**

Technology Editor Laurianne McLaughlin can be reached at lmclaughlin@cio.com. To comment on this article, go to the online version at www.cio.com/101506.

Video Tools

Appliances to enforce rules and manage bandwidth

IF THE HEAVY USE of streaming video, Web apps, or large documents are clogging your WAN pipe and degrading application performance, network appliances can help you manage the situation. Traditional bandwidth allocation appliances help ensure that critical applications get bandwidth priority. Newer appliances offer rules you can set for video.

Juniper WXC 500 and 250: These bandwidth allocation devices can help an enterprise deal with video and applications that are taxing WAN bandwidth. With 40GB to 3-terabyte hard drives, they also store pieces of frequently revised large files so that only the changes travel over the WAN.

Cisco WAE appliances: These WAE modules and appliances are part of Cisco's WAN optimization solution that monitors and manages how bandwidth is used by different applications and video. Cisco Application and Content Networking System software for these appliances and add-on modules for Cisco Integrated Services Routers will add functionality specifically for video, including compression, caching and other tricks to reduce the flow of video-related data over the WAN.

Blue Coat SG appliances: Can make video rules easy to apply, based on your preferences. For example, you may want to block specific sites or parts of sites, at specific times, or simply slow down streaming video when the WAN pipe becomes clogged. Uses caching, compression and intelligent handling of the video stream to reduce the amount of video-related traffic on the WAN.

—L.M.

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How to Get Inspired

Leading innovation requires creativity. That means you have to think like an artist.



As leaders, we are charged with marshaling the innovative energy in our organizations. And we work hard at it. It's too bad innovation doesn't happen from hard work alone; if it did, we'd have all we need.

But innovation calls for more than diligence. At the center of every innovation there is the proverbial "Aha" moment, that moment of inspiration when you see something about a particular problem that you haven't seen before. I have learned about this moment of inspiration from watching my wife, who is a dancer and choreographer, go through the process of looking for inspiration. Sometimes it seems to come out of nowhere; sometimes from a piece of music; and sometimes, to my surprise, from something I say or do.

Getting inspiration, then crafting it into a stage production, is what a performing artist does. Getting inspiration and crafting it into an IT system is what a CIO does. Perhaps no one would call us artists, but in order to foster innovation, we CIOs need to learn from artists.

How Artists Work

When seeking innovation we typically ask, How do we get ideas? But that's the wrong question. I don't think we get ideas; I think the ideas get us. Artists routinely say their best ideas seem to come from outside of themselves; what they do is give form to those ideas through whatever medium they are working in, be it painting, sculpture, dance, music, film or literature.

The better question to ask is, How do we put ourselves in a frame of mind where we can receive inspiration when it comes

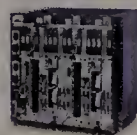
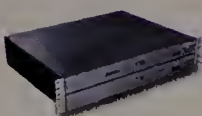


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to us? Artists have been wrestling with this question for millennia. Here are some things I see artists do when they work:

- **They immerse themselves in their subjects.** Actors immerse themselves in the personalities and histories of their characters, painters do sketch after sketch of an image, and musicians experiment with many different sequences of notes and tempos.
- **They collaborate.** Many forms of art require effective collaboration between groups of people with complementary skills. My wife works closely with the dancers in her company, lighting designers, costume designers and musicians. She combines their different ideas to give form to her dance.
- **They play with different ideas.** They don't dismiss an idea just because it seems strange at first. My wife and her collaborators try out different combinations of movement, light, costumes and music to see what happens.

Inspiration occurs when a certain combination of ideas suddenly reveals a simple underlying pattern that ties the work together and expresses what the artistic work is about. Artists say they know the inspiration is authentic if they have an intellectual, emotional and physical response to it. Once that happens, there's a flurry of activity as people flesh out their inspiration and give it shape. During this period, artists work long hours; they become single-minded about bringing their ideas into tangible form and presenting them to the world.

And once a big project is finished or a big show is done, artists leave town. Being creative is emotionally and physically taxing. Artists feel drained after they've done good work. They take time off to recharge.

Finding Your Muse

Extrapolating from my experience with artists, I see four basic skills that the innovative CIO needs to cultivate in order to excel at innovation:

1. Immerse yourself in the business. It almost goes without saying that you should have a good grasp of the concepts and rules that guide the business operations of your company. This means a good working understanding of how each business activity fits into the overall business, how the work in each activity is performed, and what the cost and profit factors are.

2. Collaborate frequently. CIOs need to innovate in the face of high levels of complexity in both business processes

and technology. Complexity can be handled more easily if groups of people from IT and business units work together, bringing their complementary skills to bear on a problem.

The innovative CIO orchestrates this process.

3. Tolerate uncertainty. It is an act of discipline and sometimes of courage to immerse oneself in the details of a problem and resist the temptation to rush to judgment about what should be done. Because of the complexity inherent in most business problems, it is unlikely that the first few ideas to come along will be truly innovative. Don't dismiss ideas just because they defy preconceived notions, and don't give

Simple patterns of expression are an effective way to communicate. System designs that are simple are more likely to be built successfully.

in to pressure to start building something before you get the inspiration you need.

4. Look for simple patterns. As you investigate ideas and combine them in different ways to create system designs, look for designs where all the elements fit together in a simple, logical and complementary fashion. Remember that complex system designs usually signify that solutions have not been completely explored. When you find a simple combination of workflow processes and technology that can satisfy a wide variety of business requirements, then you have an innovative design.

Simplicity is important to artists because audiences can understand simple patterns of expression more easily, and so these are an effective way to communicate ideas. Simplicity in system design works well for a CIO because system designs that are uncomplicated are more likely to be built successfully and more likely to perform as expected.

As you and your team develop these four skills, you will see a remarkable increase in the innovation that happens in your organization. We CIOs are already good at working long and hard to get things done. When we combine that ability with an ability to discover inspirational ideas, then we unleash a powerful process for giving our companies the tools they need to compete and succeed.

Finally, remember that innovation is an art more than a science. As you become an innovator, you become an artist. So do as the artists do when you finish that big project—get out of town. Don't bring your BlackBerry. Have fun. All work and no play makes a dull CIO, and no dull CIO has a chance as an innovator. **CIO**

More About Creativity

Mike Hugos blogs about getting inspired in **DOING BUSINESS IN REAL-TIME** at blogs.cio.com.

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Digital Subversives

Are employees compromising security by bringing consumer tech into the enterprise? Perhaps, but if you use too heavy a hand to stop them, you'll be fighting a losing battle.



Power users" can be demanding pains in the butt. And tech-savvy managers may be relentless thorns in your side. But the employees with the greatest potential to make your enterprise life a seething hell of killer viruses, data loss, network disruptions, compromised security and contempt for your professional competence are the "ordinary" folks who think their technologies belong on your network (see "Consumer Appeal," Page 63).

They care not that Skype is a terrific vector for viruses or that a MySpace account will prove to be an information sieve or that making the company's uber-customized "sales-force automation" system run on their BlackBerrys will take months of programming.

They don't think twice about using 1-gig memory sticks to back up customer data and then losing the sticks on a trip. Maybe, in the interests of good supplier or customer relationships they'll put a behind-the-firewall link on del.icio.us to help answer a question or two—and then call your people screaming that you've made them look bad because it's inaccessible.

Employees just suck, don't they? It's bad enough that they don't read the documentation, follow the rules or make even a minimal effort to get the most they can out of internal IT systems. Now they're bringing every consumer electronics gizmo they've purchased, website they've accessed and IM account they've set up into the enterprise, and they expect you to support them. Just what do they think they're doing?

The answer to that question is the reason the surging challenge of consumer technologies will get worse before it gets better and why the problem can—at best—be managed and not solved.

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An emerging majority of employees honestly believe that the technology they use outside the organization is superior to the technology they use inside the enterprise. They feel they're getting a swifter and more valuable user experience interacting with eBay than with your supply chain software; Google's better than your DBMS; Skype beats your phone system; and AOL wins because you don't allow IM or "buddy lists."

What's more, the savvier employees with teenagers look at MySpace and Facebook and wonder why IT isn't adapting those kinds of social networking genres for project management and hiring systems. They wonder why they get better, faster, cheaper or free software services outside the firewall.

Declaring war on external technologies turns your employees into innovation insurgents and "Google guerrillas." You are defining them as enemies, and enemies have little interest in cooperation.

They think you're too slow, cautious, unmotivated. They think you suck. If they like you, they simply think you're too busy.

So that's their excuse for bringing external technologies and services into the enterprise: You can't and/or you won't.

Further complicating this dynamic is the reality that most of your better employees now take their work home and on the road. Companies have (successfully) used IT to both blur and dissolve the lines between the office and the home. Well, two can play at that game. Employees once dependent on enterprise software to finish a project over the weekend now want to be able to integrate software and services from websites you might not like or trust. Too bad for you.

Historically, IT's response to technical insubordination is prohibition: Employees are forbidden from using Skype, IM, personal e-mail accounts and so on. I remember that in the 1980s, more than a few Fortune 500 IT shops didn't allow personal computers. In the 1990s, corporate IT tried to stamp out unauthorized local networks that various workgroups had set up for themselves because IT hadn't gotten around to supporting them. No wonder IT got a reputation as "user hostile."

Guess what? Last millennium's authoritarian/totalitarian IT enterprise culture approach to innovation imports can't work. Declaring war on external technologies turns your employees into innovation insurgents and "Google guerrillas." You are defining them as enemies, and enemies have little interest in cooperation and collaboration. No—they're interested in figuring out workarounds and countermeasures.

They're not doing this out of spite; they're doing it because using these tools and technologies makes their work lives easier, better and more productive. Do employees occasionally and, yes, inappropriately use these sites and technologies

for personal use—booking travel, buying products, sending personal messages? Of course. Then again, they're also doing work at home and during personal time while on the road. Does IT really want to be Big Brother, Supernanny and Techno-enforcer all in one? As the CIO, is that the "employee empowerment" brand you want for IT?

Enormous reservoirs of time, money, resources and hostility are consumed in this losing battle to define what employees cannot or should not use. Don't do it. People will use IM whether you like it or not. People will use their cell phones to access proprietary databases. The core concern is that some of these behaviors are far riskier than others. IT's traditional role of identifying such risks in order to eliminate them is no longer sustainable—not when the quality of external options is so often superior to the quality of internal service.

There is no cost-effective "solution" to this challenge; there is, however, a constructive approach. Don't compete; don't combat; co-opt. Organize advisory groups of employees who flout your rules on external innovation and relentlessly get their input on how helpful you should be. The purpose is not to cater to their whims or get them to like you better. It's to exchange ideas and insights around risk. It is not your job to eliminate risk; it's your job to manage it.

You and your folks (should) know way more about the technical risks of these technologies than your employees. How well do you communicate and explain risk scenarios? To what extent do your employees appreciate that there are often very simple, easy things they can do to dramatically reduce their individual and your institutional exposure to risk?

It's foolish and counterproductive to let IT's and Legal's "eliminationist" policies get in the way of good risk management. And it undermines relations with employees when you introduce new systems and services.

How well CIOs and IT should leverage external innovation to amplify core IT processes deserves future discussion. But for now, CIOs need to turn their shops away from declaring war on their digital subversives and instead invite them to better understand the nature of enterprise risk. These people are using these technologies because they're smart, not because they're stupid. They're smart enough to understand the difference between risk elimination and risk management too. **CIO**

Sound Off on Consumer Tech

Michael Schrage and others sound off on consumer tech and more in a fast-paced webcast at www.pqhp.com/idg/cio100-06.

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Michael Schrage (schrage@media.mit.edu) is codirector of the MIT Media Lab's eMarkets Initiative. To comment on this article, go to the online version at www.cio.com/101506.



Optimizing Server Resources **in Today's Enterprise**

Executive Summary

In recent years, the widespread adoption of servers has fundamentally changed the way organizations manage data, information and knowledge. It has ushered in substantial cost savings and helped enterprises manage work and business processes far more efficiently. However, the use of large numbers of servers has created an entirely different set of challenges. Managing and optimizing these systems is paramount.

To optimize IT and business operations, it's essential to step beyond the flat earth of incremental improvements and develop an effective strategy for logical and geographic server consolidation across an enterprise.

Unfortunately, few companies have created an overall strategy for optimizing a server environment. Many are buried under an array of everyday server problems—patch management, resource utilization, security, server sprawl and management flexibility. Although IT administrators look to improve performance, they don't recognize the need to embrace server consolidation as a core strategy.



Microsoft

Building a Better IT Department

Efficient use of resources can help organizations achieve better performance and service levels at a lower cost. A more efficient use of resources delivers a higher return on assets (ROA), lower total cost of ownership (TCO) and a streamlined IT environment that lets staff focus on strategic rather than administrative tasks. An effective consolidation initiative trims systems maintenance and cooling costs, reduces systems license fees, simplifies patching and security, boosts system availability, and improves backups and data recovery.

What makes server consolidation so powerful is that it simplifies the management of heterogeneous hardware and software. Ultimately, that organization will be able to standardize on fewer applications and operating systems, centralize data management and consolidate applications and operating systems. Flexibility and scalability become realistic goals.

Solutions like Microsoft®'s Virtual Server 2005 R2 and Windows® Server 2003 R2 can play a role. Virtual Server 2005 R2 is ideal for server consolidation in both the datacenter and the branch office, allowing organizations to make more efficient use of hardware resources. Windows Server 2003 R2, Enterprise Edition delivers the business value, technical features and software licensing that are designed to help customers take advantage of the benefits of server consolidation technology in today's IT environment.

Confronting Inefficiency

Navigating today's IT environment is no simple task. A recent study conducted by IDG Research on behalf of Microsoft found that respondents had, on average, five different brands of servers installed within their enterprise. Twenty-five percent had five or more server vendors represented within the organization. In many instances, an array of manufacturers, operating systems and business requirements translates into unnecessary duplication of systems and an inefficient use of resources. Under-managed resources adversely impact computing costs and organizational efficiency.

SERVERS DEPLOYED ACROSS THE ENTERPRISE



Mean number of servers across enterprise = 2,992

Median number of servers across enterprise = 200

Organizations face a number of issues when attempting to optimize a server environment, including patch management, resource utilization, maintenance costs, server sprawl, interoperability, downtime, site licensing costs, and space and energy costs. Companies also face headaches related to managing and retrieving data. Not surprisingly, at some point, customers, business partners and employees feel the impact. What's more, the organization may find itself facing lagging in productivity and performance.

THE BIGGEST CHALLENGES IN MANAGING A SERVER INFRASTRUCTURE



Most executives understand that a server infrastructure affects various initiatives within the organization. Among the leading concerns are delivering consistent service levels, instituting disaster recovery provisions and protecting internal environments. Also important are optimizing utilization, planning applications, storage, data reduction and redesign more effectively, and achieving greater standardization.

In addition, organizations are increasingly looking to consolidate workloads in a number of areas, including databases, business applications, file and print, email, Web and networking. IT executives and business decision makers have a growing need to develop both tactical and strategic approaches for dealing with the byproduct of today's complex computing environments.

Seeking Solutions

Server consolidation is a term that's used to describe the strategy of moving multiple applications onto a single physical server—thus saving both hardware and ongoing management costs. Server consolidation encompasses four primary goals:

The need for better server utilization. Enterprises that maximize the use of servers for processor power, memory and storage achieve per-

formance gains in the range of 30 percent to 70 percent. Ensuring that servers are tuned correctly can help redistribute processor load and reduce the imbalance that often occurs within today's complex IT systems. Adding virtualization—the ability to store operating systems and data logically across numerous servers (rather than physically)—can further boost results.

Improving server management. Complex environments lead to enormous demands on staff and equipment. By reducing or eliminating much of the administrative burden that surrounds an IT environment—maintaining operating systems, overseeing applications, backing up data, and more—organizations are able to use hardware and IT staff far more effectively...and strategically. What's more, they are able to cut down on software licenses and cooling costs. In some cases, they are also able to reduce the space needed to house servers and data centers.

Increasing reliability. Improving availability and building better backup systems helps an enterprise reduce risk and improve data delivery. The goal is to reduce system downtime and mitigate financial risks while providing a high service level for customers, business partners and employees. Greater reliability also translates into improved levels of security and protection.

Improving flexibility, scalability and agility. With the right systems in place, an organization can react to changing business conditions more nimbly and decisively. The ability to deploy servers efficiently and create a well-designed IT infrastructure is the foundation for present-day performance and future growth. The result is an ability to access information more quickly and deploy new systems strategically.

Taking Consolidation to the Next Level

Organizations can cut server costs by 30 to 40 percent by maximizing resources—and thus consolidate their server infrastructure. Typically, one IT administrator is required for every 25 servers deployed throughout an organization. These administrators do not add to the value of a server environment; they simply help manage the growth of servers as an enterprise grows. An effective consolidation initiative can double the number of servers an administrator can handle.

Consolidation may tap into a number of tools, including Windows System Resource Manager (which enables IT administrators to manage CPU and memory utilization on a per-process basis), support of side-by-side DLLs, the ability to run multiple instances of Internet Information Services (IIS), multipath I/O that supports SANs, and shadow copy capabilities to restore data environments.

While an array of events might trigger the need for server consolidation, the common denominator is a well-defined set of benefits: improved TCO, better corporate standards, improved service levels and availability, improved disaster recovery capabilities and enhanced system management.

And with tools like System Center Virtual Machine Manager (now in beta) IT decision-makers now have a unified set of tools for managing the complete infrastructure—both physical and virtual environments, plus the application stacks on top.

Tapping into the Power of Virtualization

Virtualization replaces the traditional approach of removing and adding storage by treating numerous storage devices as a single logical entity. Because the environment does not distinguish among physical media contained within servers, a system administrator can swap

devices at any time without reconfiguring the entire infrastructure. The ability to run different operating systems and applications on the same physical server lets organizations consolidate the workload placed on servers. If one virtual system fails, another can take over instantly and perform the same tasks.

On the Front Lines of Business

Every organization faces its own set of roadblocks—and must blaze its own path to success when working to manage server resources most efficiently. At one Atlanta-based restaurant chain, the biggest challenge was limited space in its data center. The company has already moved the data center once because of a “one-application, one-server” mentality. Virtualization and consolidation will allow the company to use resources within the data center more effectively, reduce the number of servers and allocate computing power more efficiently.

Putting a strategy into play creates additional challenges, however. The company faces an additional investment in a storage solution and, as one IT executive puts it, there is much concern about adding to “an already significant investment in the separate storage needs of the applications we run.” Furthermore, the company must cost-justify replacing servers that are relatively new,

QUICK FACTS:

- More than two-thirds of companies **(70 percent)** have a server consolidation strategy already in place.
- Overall, **82 percent** of respondents in the CIO survey viewed server consolidation as a moderate, high or critical priority.
- Only **11 percent** rated it as low priority and **6 percent** rated it as “not a priority.”

using TCO and ROI analyses to show that the new environment will lead to long-term cost savings through reductions in facilities and management costs.

The company's long-term goal is the development of a consolidated platform that it can quickly and easily adjust to the needs of the business.

Other organizations are also taking

Rapid growth translates into rapidly changing business and IT requirements

As more and more components of the IT infrastructure—such as storage, servers, and network—become virtualized, the flexibility of the system grows substantially. By enabling business policy to be used as a driver for the systems and resources that are available, you can make the move from flexible systems to truly dynamic systems. To support this infrastructure flexibility with software licensing flexibility, Microsoft took the industry-leading step to revamp our Windows Server and Windows Server System application (SQL, Exchange, etc.) licenses to make them virtualization-compatible. For example,

- It is now possible to run up to four virtual instances of Windows Server 2003 R2 Enterprise Edition on one licensed physical server or hardware partition.
- Windows Server System applications running in a virtual environment are now licensed per virtual processors instead of physical processors.
- Starting Oct. 1, 2006, new servers licensed with Windows Server Datacenter Edition (and previous licenses with new version rights) will have license rights to run an unlimited number of virtualized Windows Server instances. By simply licensing the server's processors with Windows Server Datacenter Edition, customers will be able to run Windows Server Standard Edition, Enterprise Edition, Datacenter Edition, or a mix of the three editions without having to track the number of virtual machines or pay for additional Windows Server licenses.

heed. At a large financial services firm in Canada, executives view server consolidation as a strategic and fundamental requirement. Data center efficiency, asset control and optimization, and total cost of ownership (TCO) are all key drivers. The company has marched forward with an initiative that has already improved provisioning workflow from six weeks to three days. Using virtualization, it has boosted the operational effectiveness of assets and driven down operational costs.

Increasingly complex IT environments require increasingly innovative approaches. At a leading food producer based in New York State, rapid growth translates into rapidly changing business and IT requirements. Because the company's infrastructure can no longer support more servers, the company has identified key strategic and tactical objectives and developed a plan to affect change.

The former includes high availability and faster deployment of new servers. The latter involves using load balancing across a pool of servers and achieving high availability of applications. Over time, the firm has moved outdated Windows 2000 servers to a virtual environment based on a newer version of Windows OS, and it has migrated numerous physical servers into the virtual realm as well. The initiative has saved the organization staff time and money while boosting availability for existing hardware.

Conclusion

The complexities associated with today's distributed IT systems are driving businesses to spend as much as 70 to 80 percent of their IT budget just to maintain what they have. In addition to driving up the costs of operations, the complexity of these systems is at the source of many challenges across the entire IT lifecycle.

A successful consolidation strategy doesn't merely reduce the number of physical servers within an enterprise. It creates an environment where the enterprise achieves maximum efficiency across its entire server infrastructure. When an enterprise has a well-defined server optimization strategy in place and devotes the necessary resources to affecting change, it's possible to move beyond the incremental gains that derive from the addition of more hardware and develop an IT environment that uses all systems in the most optimized and efficient way possible. Suddenly, it is possible to meet performance goals and manage growth in a way that wouldn't have previously seemed possible.

Many organizations are looking to solutions like Microsoft's Dynamic Systems Initiative to help manage the complexity. By providing "intelligence" at different layers, solutions like Microsoft Dynamic Systems Initiative can create a self-managing environment in which automation can handle most of the administrative and management tasks.

The goal: Use products like Microsoft's Dynamic Systems to create a dynamic virtualized infrastructure and make IT a true value generator for your organization. ■

Server virtualization strategy in place	
Yes	52
No	39
Don't know	9

Currently use virtualization in enterprise technology (NET)	69
■ Yes – for development, testing and production – specific workloads only	36
■ Yes – for development and testing only	24
■ Yes – for development, testing and production – most or all workloads	9
No, we don't use virtualization	27
I don't know what virtualization is	4

Source: IDG Research



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Lessons for the Mentor

How one CIO got the extra resources she needed while learning how to help young IT professionals shine **BY BARBARA KUNKEL**



For more than 20 years, I'd coached youth soccer. I took immense pleasure in developing, guiding and motivating young players, both on and off the field. In turn, their enthusiasm energized me.

Six years ago, unfortunately, I had to put my coaching on hold to deal with my mounting responsibilities as CIO of a growing national law firm. But when a series of mergers led to a significant increase in my department's workload, I saw a new way to help young people learn and develop their potential. I initiated a summer college internship program to fill the resource void and, at the same time, help young women pursue careers in IT. At Nixon Peabody, only about 40 percent of the IT staff are women, and this percentage continues to shrink as it gets harder to find women with technical skills. Mentoring female summer interns, I thought, could draw more women into my department and into IT. I had no idea what lessons were in store for me over the next several years.

It was as if I were stepping onto the soccer field for the first time in my life.

What I Learned from Anna

Anna, our first summer intern, joined the department in 2001 after she completed her first year as a computer science major at Rensselaer Polytechnic Institute. Her first week of orientation included an overview of the firm and its technology tools. Her first assignment, reporting to the supervisor of desktop support, tested her knowledge of hardware and put her on the front line with the internal customers. Anna adjusted quickly and appeared to enjoy the work. She was technically competent, a natural. But in checking with both her and her super-



CIO EXECUTIVE VIEWPOINT

Compliance Bonus

Lucent leverages SOX challenge to transform IT

Elizabeth Hackenson**Chief Information Officer for Lucent Technologies**

In just 11 months, Lucent Technologies turned a compliance challenge into a business victory. The company met Sarbanes-Oxley 404 compliance requirements while simultaneously transforming its global IT infrastructure, which spans 26 countries.

Elizabeth Hackenson is the Chief Information Officer for Lucent Technologies, overseeing operation of the company's information systems infrastructure, including global communications systems, corporate networks, and e-business platforms. She joined Lucent Technologies in April 2006.

What were some of the key challenges faced by Lucent in meeting Sarbanes-Oxley certification requirements? Why?

The challenge was to transform IT globally to comply with SOX 2002 certification requirements in a short timeframe. This was a common concern for all CIOs at the time – how to gain visibility to process controls on a global level while meeting Sarbanes-Oxley compliance.

The transition plan for an organization as large as ours was complex, involving thousands of people across multiple time zones and languages, and the timeframe was

“Don't think you are ever done, because it's a learning process. IT transformation is a journey.”

extremely short. We knew we needed strong executive sponsorship, and a dedicated team to drive to aggressive milestones to meet regulatory deadlines.

What were some of the key organizational issues that influenced Lucent's global IT transformation?

Lucent needed to adjust the entire organization to changing business requirements, while continuing to provide 24x7 support to a global workforce of more than 35,000 employees. We needed to bring together disparate global processes, in a heterogeneous environment, with hundreds of applications, thousands of servers, and a variety of support models, all in less than a year.

A major challenge was to get our people to adopt dramatically different processes and best-practice models, while maintaining day-to-day operations. It was really hard to strike the right balance and make the trade-offs to keep moving forward. The critical word was *balance*.

How did you successfully address resistance to change?

We sought to gain support from strong influencers within each organization, sharing with them the business case and getting their buy-in so they could head off resistance to the changes.

We also received tremendous support from the CFO and CEO. Early executive sponsorship was key. We articulated frequently to them the benefits of the automated project and compared the outcomes to the previous manual processes, highlighting the improvements. Frequent reviews with the management team increased executive mindshare for the project.

Continuous communication to staff during the 11 months, as we made changes, was important. We went back to

our influencers and supporters to ask: Did you know that (because of the new technology) we see this kind of trend going on in the application environment that can now be proactively addressed? This enabled us to emphasize clear benefits to offset the transformation pain.

This project will stand as an example for future IT transformations.

In sum, what were the key HP differentiators that resulted in a successful deployment and Lucent's business/IT alignment?

HP provided a solution with an architecture built on ITIL. Not only were processes pre-defined, but also tools were set up in advance. HP provided a best-practices IT Service Management deployment model and the consulting expertise to implement a full solution.

We did take the opportunity to invest in software (HP OpenView Service Desk and HP OpenView Operations) that provided quite



a bit of benefit post-SOX. HP OpenView gave us an important capability for a global company – to have all of our systems, applications, and processes recorded in a common configuration management database, which helps us better manage our global IT environment and gives us visibility that we didn't have before.

Can you share some success secrets for implementing change in a large global organization such as yours?

If you believe you need to do it, invest wisely in the right leadership team and build a business case for the right level of funding. Get people aligned and trained. Don't underestimate the need for supporters both in management and within the IT user community.

Don't think you are ever done, because it's a learning process. IT transformation is a journey.

For More Information:

Check out this white paper, “Transforming the IT Infrastructure”, at www.cio.com/whitepapers/hp

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visor, I learned that something wasn't right.

The supervisor felt Anna was too shy, and the independent nature of the work did not suit her. Anna, in turn, wanted more challenges and more feedback, and she wanted to be more connected to the organization through group projects.

I dropped by Anna's office one afternoon and asked her to join me for ice cream at the mall next to our building. As we chatted about her sports activities from high school, her shyness melted. I learned quite a bit about how differently her generation views school, work and careers. We sat for two hours, laughing about stories from my generation (for instance, how my friends thought it would be funny to shuffle a sequence of computer punch cards so that my program would not run correctly). Her stories were similar in tone, except the tools and venues were IM, chat rooms and cell phone photos.

With only six weeks left before Anna returned to school, we had reached a fork in the road. I discussed the situation with my managers and we decided to reassign Anna to a Web development project, working closely with another developer and a business analyst. It demanded that she "come out of her shell," relate to users as a member of the IT team, and act more independently and creatively. Before returning to school, Anna developed a Web-based BlackBerry request form as part of

our service request system that both improved service request efficiency and enhanced her internship experience.

Anna had changed from a shy, quiet individual to an energized contributor to the team. She relished the experience and looked forward to returning to our firm the following summer. And these five lessons I learned from her about the next generation remain etched in my brain.

1. A structured work environment that clearly links the interns' assignments to the overall objectives of the organization reinforces the idea that the work matters.

2. Working in teams is far more desirable than working independently.

3. Demanding that interns think creatively makes the work much more rewarding.

4. Communication is essential! They thirst for feedback.

5. The personal touch and a social environment are important aspects of their work experience.

How I Applied Anna's Lessons

In 2004 I wanted to expand our strategic planning process to include benchmark data on the effective use of technology at other law firms. To do that, we hired two college interns for the summer, Katie and Bridgette. This time, the interns would

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work directly with me.

With the help of my staff, I designed a "work curriculum," similar to a college course. This provided the framework that linked the interns' assignments to the project objectives. Katie and Bridgette started their work by meeting with me to discuss expectations. By the end of the session, I could see their creative wheels whirring, but the task's scope intimidated them. However, a pep talk provided them with the confidence they needed.

As with Anna, the first week of orientation included an overview of the firm and its technology tools. However, as part of their assignment, Katie and Bridgette were each to craft an e-mail, addressed to the entire IT department, introducing themselves. I laughed when I saw the first e-mail, with the subject line "A little more info about the mysterious girl in the corner." It was both humorous and engaging, and it generated a whirlwind of interaction in the department. The interns were off to a great start. I was confident their social needs were going to be met right away.

It was important for me to assess their communication skills because this assignment required meetings, phone calls and e-mail with senior management, department heads and CIOs at other firms. I decided to give Katie and Bridgette some

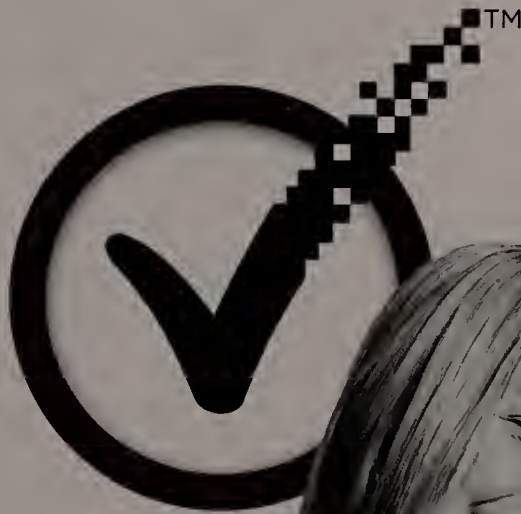
frank advice. "Relationship building is everything," I told them, "and cryptic instant messaging will be the demise of your assignment." I also requested that they e-mail me a 100-to-300-word weekly summary every Friday, telling me what they'd learned while reporting on the project's progress. Every Monday morning, I'd give them feedback. This process fostered a continuous, open dialogue.

At the end of the summer, Katie and Bridgette had to give a PowerPoint presentation to the department heads, summarizing their project. Their performance was impressive, and in fact, it's one of the highlights of my career—the equivalent of building a dream team for the soccer season. The field of play may be different, but the goal remains the same: nurturing talent through good mentoring. **CIO**

Barbara Kunkel is CIO of law firm Nixon Peabody in Rochester, N.Y., and is a member of the CIO Executive Council. To comment on this article, go to the online version at www.cio.com/101506.

A Curriculum for Interns

To check out Barbara Kunkel's curriculum for her IT interns, including assignments, requirements and more, go to www.cio.com/101506.



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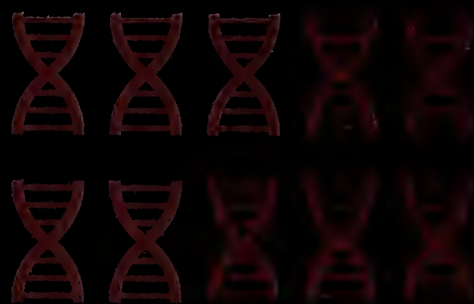
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Agere Systems Director of IT Infrastructure **Chris Morris** "persuaded" his suppliers and customers to use E2open's supply chain services by showing them the value it could return to both parties.

The era of do-it-yourself supply chain integration—its costs, its risks and its drain on your IT resources—is coming to an end. Help has arrived.

Integration Liberation

BY THOMAS WAILGUM

NINE MONTHS. That's how long it typically took Agere Systems' IT staff to set up an electronic trading connection to a major supplier or customer.

Nine months for each and every one.

"We did every bit of integration ourselves, and every supplier's connection *had* to be different," says Chris Morris, the director of IT infrastructure and operations at the semiconductor maker.

Worse, those connections—whether via e-mail, the Web or more complex linkages like electronic data interchange (EDI) or the high-tech industry's own electronic lingua franca, RosettaNet—were all supported by different and ultimately inefficient processes inside Agere. Procurement staffers had to chase down orders via phone, fax or e-mail, and manually key in EDI data into Agere's Oracle ERP system. And Oracle could do little to help. Morris says Oracle's supply chain tool had neither the external-facing, automated service capabilities nor the reporting, metrics and error-handling features that Agere wanted and Morris felt the company needed.

There had to be a better way to make the connections.

There was.

The Trail of Broken Links

Morris, of course, isn't alone. Plenty of today's supply chains are slowed and even crippled by entrenched manual processes and disconnected enterprise systems. Right now, says Noha Tohamy, a supply chain and pricing solutions analyst at Forrester Research, "there's no significant integration between manufacturers and their suppliers' and customers' enterprise systems." Supporting her claim, more than 60 percent of companies

Reader ROI

- :: Why traditional forms of supply chain integration have become untenable
- :: Which new forms of integration are emerging
- :: How a hosted supply chain network works



responding to an April 2006 Aberdeen Group survey described their current supply chain processes as manual, spreadsheet-intensive, only partially automated and dependent upon different software systems within their own companies.

In short, the current state of the supply chain is not too good.

The reasons for the disconnects with supply chain partners are many, beginning with the fact that CIOs are still struggling to integrate their own ERP applications with their own supply chains, never mind connecting to and integrating with their partners'. Indeed, 60 percent of the respondents

to a 2005 Aberdeen Group survey said complete internal integration would give them a competitive advantage—if only they could manage to do it.

The back-office enterprise systems in most companies weren't designed to support the multiapplication, external-facing services that real-time supply chains require. They're too inflexible. "When you want to make a change [to your legacy ERP or SCM system], it's basically like ripping up concrete," says Beth Enslow, senior VP of enterprise research at Aberdeen Group.

But whether they realize it or not, the era is over of CIOs thinking that they can con-

nect multiple, external systems, that they'll have the money and staff expertise to do it, and that communications protocols like EDI and RosettaNet will somehow magically integrate their supply chain information for them. Done. Finished. Why? Because that thinking has rarely produced any value for the enterprise. In one Forrester report, nearly 60 percent of the companies surveyed said they did not achieve the expected ROI from their supply chain management technology solutions.

"Traditional electronic data interchange, value-added networks are dead," says Benoit Lheureux, a research director in Gart-

The Hosted Supply Chain Menu

Before you sign on to use the B2B services of the new integration service providers, you should know your options

Multitenant	Multi-Instance Shared Service	ASP and Utility ASP	Hybrid	Evolving EDI/VAN Service Providers
Definition: Multiple companies use the same instance of hosted software. Advantage: Lower costs and shorter implementation times than could be achieved in the standard ASP model because the cost of software, hardware and connections among partners are shared. Drawback: Hard to migrate implementation in-house. Vendors: LeanLogistics, Management Dynamics, Sterling Commerce/Nistevo, TradeBeam, WeSupply	Definition: Each company is given its own instance of the software but shares some common services, such as integration platform and security models. Advantage: Assurance of data security and flexibility for unique data storage or performance requirements. Drawbacks: More limited community benefits; shared services must be able to scale as adoption grows. Vendor: E2open	Definition: In the ASP model, the application is hosted by the vendor or by an outside hosting company in a separate instance on external servers. In the utility ASP model, the servers are shared by multiple companies. Advantages: Somewhat faster deployment than in-house implementation; enhanced ability to customize applications. Drawbacks: No ability to share cost of hardware or business partner connections; no native community benefits. Vendors: Edge Dynamics, Red Prairie	Definition: Primary SCM application located on your premises or your trading partner's. Supplementary functionality provided via on-demand model. Advantage: Creates new value from existing in-house SCM implementations without having to staff an in-house IT project. Drawback: Implementation and maintenance costs are no lower for your primary SCM application. Vendors: Kinaxis	Definition: Vendors offer hosted integration services, which include some combination of communication, integration, trading partner management and application services. Advantage: Can offer traditional services as well as more innovative capabilities, which utilize SOA and offer multiprotocol functionality. Drawback: Too many vendors still trying to differentiate themselves. Vendors: ADX, GXS, Sterling Commerce

—T.W.

SOURCES: Aberdeen Group, Gartner

INNOVATIONS IN

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Florida Guardian ad Litem Saw the Future of Child Advocacy. Citrix Provided Access.



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For many CIOs, this is very bad news indeed.

A New Way to Integrate

Fortunately, hope for supply chain information integration did not die with those

old, kludgy networks. As Agere and many other companies have discovered, there's an emerging category of third-party, hosted options that successfully blend traditional value-added network (VAN) capabilities with on-demand hosted supply chain software and back-office integration services. Companies in this evolving market,

Since going live with hosted services for order management and inventory, Imperial Sugar CIO **George Muller** (standing in an old sugar mill) has found that his staffers are "managing exceptions rather than every transaction. They can focus instead on higher-value activities."

such as E2open, GXS, Inovis and Sterling Commerce, offer a single point of data exchange—whether using EDI, RosettaNet or XML standards—that acts as a gateway for partner-to-partner, enterprise system integration and collaboration. For companies like Agere, it's now possible to make a single electronic connection to all customers and suppliers if they use E2open. Even better, that task can be taken care of by a third party.

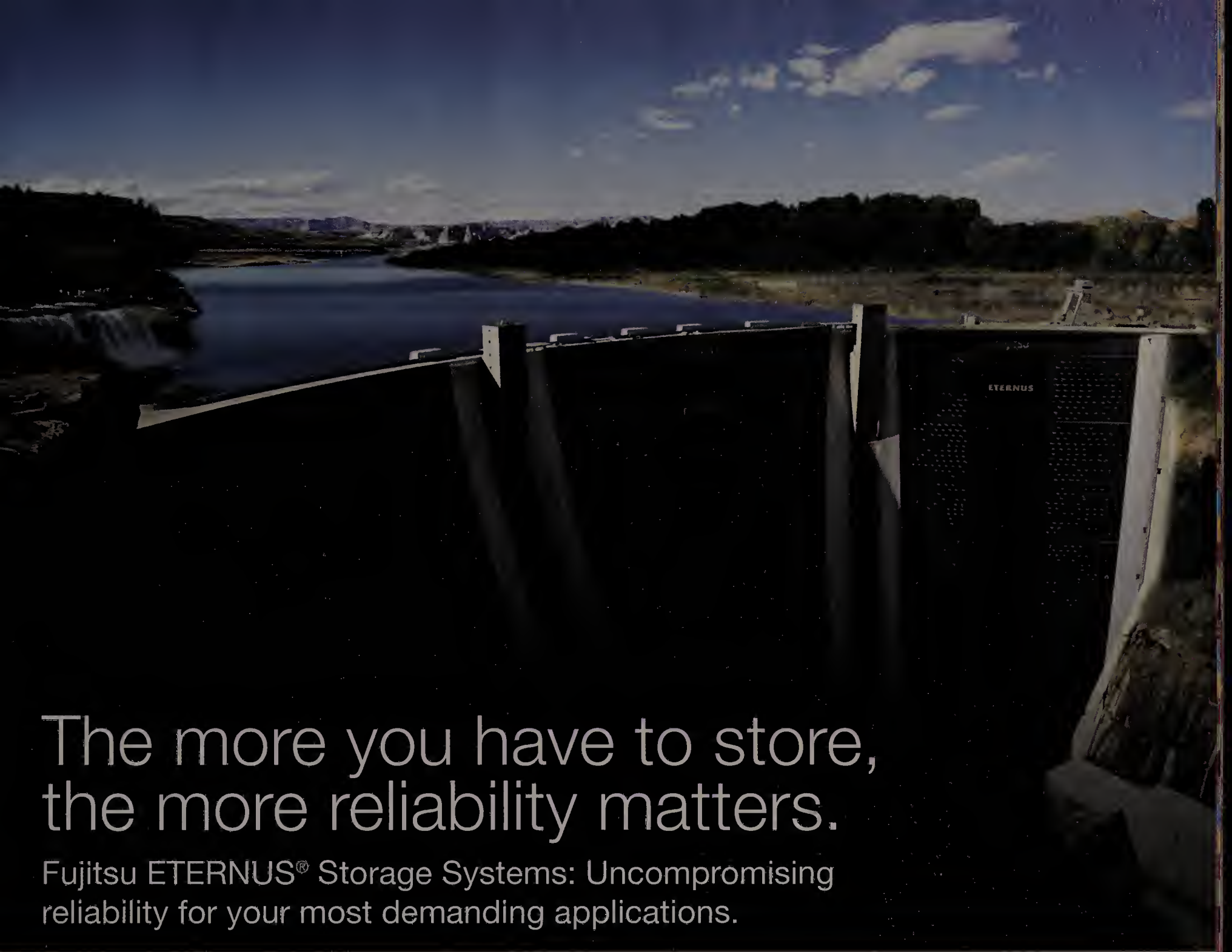
Indeed, Lheureux claims that over the past few years this new strategy has so transformed the possibilities in supply chain networking that companies and CIOs that haven't investigated the new services "have an understanding of the market that is obsolete."

The Long Wait for Integration

According to a July 2006 IDC survey (IDC is a sister company of CIO) that asked companies to describe how they collaborated with their supply chain partners, the most cited method was e-mail (88 percent). Also making the list: fax (73 percent), telephone (62 percent) and snail mail (59 percent).

These tools, which depend on employees' fingertips, have prevented many companies from capitalizing on real-time B2B collaboration. In a September 2005 Aberdeen Group study, 75 percent of survey respondents with annual revenue of more than \$1 billion report that their supply chain applications limit—not enhance—the services they can offer customers.

A root cause of this, according to analysts, is "a huge underinvestment in technology to support global supply chain processes," says Aberdeen's Enslow. "Microsoft Excel is still the most popular supply chain planning system. [However],



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THE POSSIBILITIES ARE INFINITE

it's not scalable and it does not promote collaboration—either internally or across trading partners.”

Agere's Morris says he had a wake-up call when his staffers started taking a closer look at their supply chain processes during the evaluation of E2open's services. It was not a pretty sight. “We didn't realize that this was the way we did things,” he recalls glumly.

EDI, which Agere relied on, has been a

staple of many companies' systems (63 percent in the IDC study) for a long time. But EDI has limitations. To begin with, the cost of having a VAN provider maintain EDI communications between trading partners has been prohibitive for many small and midsize companies. (For more on this, see “How to Keep the Web from Becoming a Trap,” www.cio.com/050106.) And although EDI facilitates the electronic transfer of information between partners, that data

does not flow internally between ERP and CRM systems because different vendors' applications and systems, which follow different networking and communication standards, can't interoperate. That forces companies to use manual processes to update ERP and SCM systems, generating inefficiencies and errors.

More challenges come with the internationalization of business. CIOs must deal with suppliers from every corner of the globe with varying degrees of technological sophistication, as well as multiprotocol communication mechanisms that all have to hook back into the CIOs' internal systems. According to Enslow's research, global supply chains in large enterprises were not nearly as automated as their domestic supply chains. This dependency upon a supplier's questionable systems, upon their e-mails, faxes, and phone calls, “completely stresses out ERP and spreadsheet systems,” Enslow says.

Enslow's research revealed that an astounding 90 percent of enterprises say their global supply chain technology is inadequate to provide their organizations with the timely financial information they require.

Their Software, Your Problem

Why the big enterprise vendors are not (and probably won't be) riding to the supply chain rescue

SOME CIOs, according to Beth Enslow, senior VP of enterprise research at Aberdeen Group, seem to be waiting for their enterprise vendors to solve their supply chain technology problems for them.

They could have a long wait ahead of them.

On-demand supply chain applications just aren't their ERP vendors' core competency. “PeopleSoft, even with 300 different software modules, did not have an EDI translations software suite,” says George Muller, VP and CIO of Imperial Sugar, who uses Sterling Commerce's services for order management and inventory. “PeopleSoft would handle everything very well within [our] four walls, but outside the four walls, PeopleSoft was behind the curve.”

A possible reason for ERP vendors' reluctance to develop tools to integrate their customers' systems with their suppliers' and customers' systems is that it would impact their business model: selling on-premises software to a captive customer base. With the new, hosted model, customers of the enterprise software vendors could conceivably “turn off” the connection and go to someone else if they chose.

Representatives from SAP and Oracle, the biggest enterprise systems vendors, say that they are following the on-demand, hosted SCM market with interest, but, so far, don't have anything to offer. “We are looking at the demand for this market, but we are not yet offering an on-demand model with these kinds of solutions,” says Hans Thalbauer, VP of supply chain management solution management at SAP.

“When you look at that opportunity space, that is not a service that Oracle has much interest in and competency in,” says Julian Trotman, director of enterprise integration applications development at Oracle.

However, both point to their companies' fledgling on-demand CRM offerings to illustrate their technical capabilities within the on-demand model. “It's a model that we've tried to hone over the last three to four years,” says Trotman. “It's going to be a large part of our business going forward.”

As for the rise of the on-demand SCM vendors, SAP's Thalbauer doesn't seem too worried about E2open, GXS and the others. “I don't view them as a threat,” he says.

—T.W.

Inside the Hosted Supply Chain: A Case Study

In 2001, Agere was made an offer it couldn't refuse. One of its biggest customers, disk-drive maker Seagate Technologies, strongly suggested that Agere sign on to E2open because Seagate, IBM and others in the high-tech industry thought E2open's services represented the supply chain future. (E2open had morphed from its beginnings as a dotcom-era online exchange into a vendor of hosted supply chain software.)

By June 2005, Agere had dutifully switched its supply chain front end over to E2open and with it brought along 80 of its primary component suppliers. In a fashion similar to the way Seagate “suggested” that Agere begin using E2open, Agere, according to Morris, “persuaded” its suppliers and customers to use E2open's services by showing them the value it could return to both parties. (“Of

Continued on Page 58

WHAT IF SECURITY WASN'T A CAGE?

WHAT IF, INSTEAD OF KEEPING THINGS OUT, IT LET AMAZING THINGS IN?

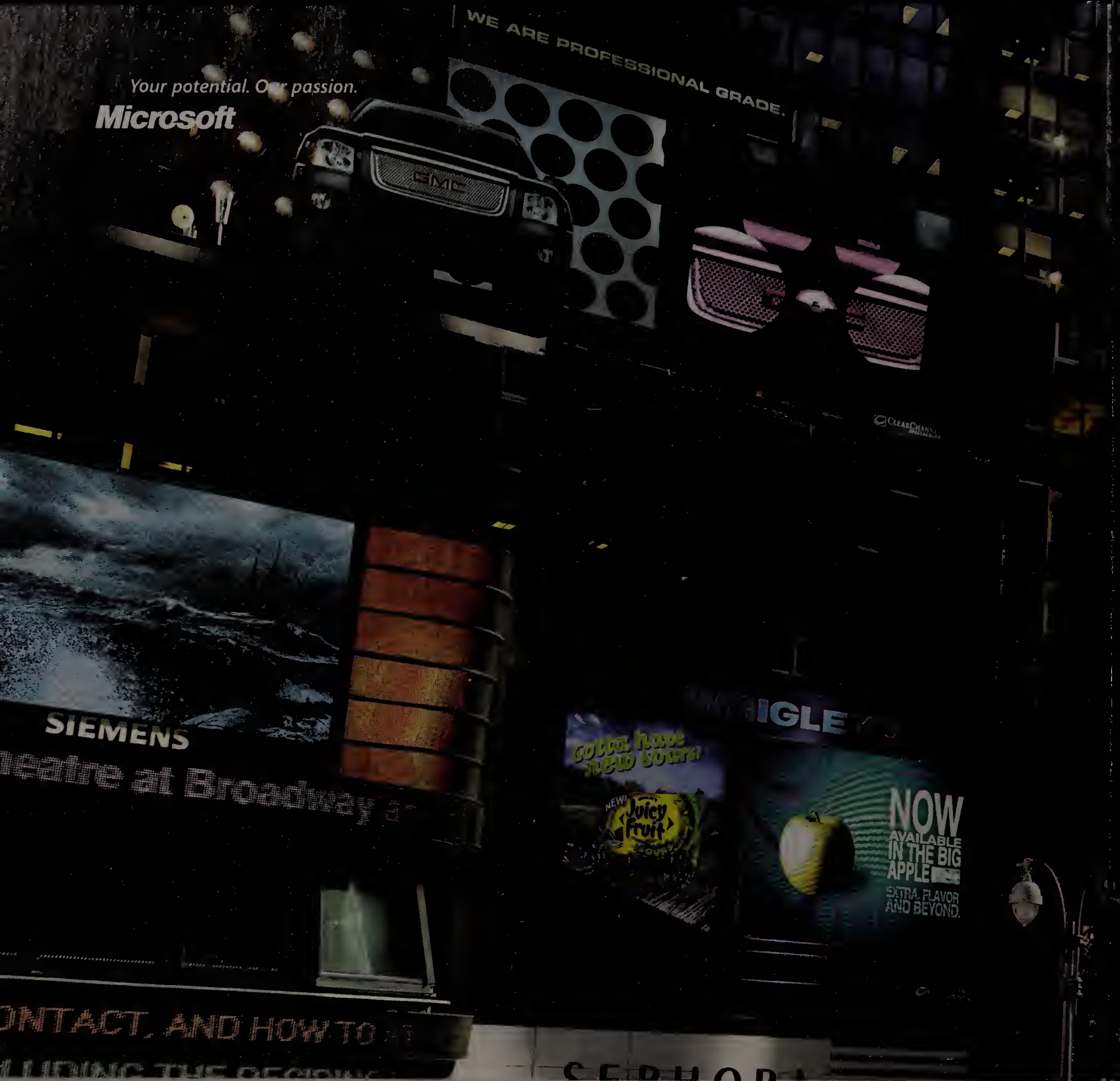
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course, some of our suppliers are a lot bigger than us," Morris points out, meaning that he couldn't simply force a partner to sign on.)

Through E2open's single, Web-enabled connection, Agere (and those of its trading partners that have signed on to use E2open's hub) now has a more accurate, timely view of demand and order management data than it did previously, when it depended largely on manual processes, including fax, e-mail and phone calls. For example, the buyers in Agere's procurement group are now able to quickly adjust order amounts to match new (and more accurate) forecasts and then modify supplier shipment data before it becomes a problem (an incorrect amount) in the back-office Oracle 11i system. On the back end, the purchasing group, which tracks the ebb and flow of purchase orders worldwide, is now able to send and receive purchase orders that are now both more up to date and accurate. And many of those manual processes are becoming a memory as supplier data is now able to flow automatically into Agere's Oracle ERP applications through E2open's hub. From a business process perspective—as well as from the IT side of the house—the savings are immense.

"With one single integration point, E2open shields us from doing the actual integration work ourselves," Morris says. "We don't see any of those problems anymore. Now [integration work] is E2open's headache."

Currently, Agere uses E2open's hosted services for forecasting, generating orders, demand and supply synchronization, and logistics visibility. Of Agere's 80 primary component suppliers hooked into E2open, four are "fully integrated," Morris says. That means that supply chain data "flows directly from their systems through E2open's and to ours without anybody touching it at all." Agere's Oracle 11i ERP system, based in its Allentown, Pa., headquarters, receives all the inventory and forecasting updates auto-

Trust, But Verify

Should you open your kimono for your suppliers and customers? It depends on how well you know them.

THE AGE-OLD ISSUE of trust rears its head once again as the hosted supply chain model allows—and encourages—enterprises to let their suppliers and customers look behind their collective firewalls. According to Noha Tohamy, Forrester Research supply chain and pricing solutions analyst, most companies feel that multienterprise integration is the only way that they can improve their supply chains "but when the rubber meets the road, companies are very cautious about what information they will share with their trading partners, and certainly what, if any, type of integration they are willing to have directly between their and their partners' systems."

Ranga Jayaraman, CIO of Hitachi Global Storage Technologies, agrees that these issues must be smoothed out before the real benefits of supply chain integration can be realized. "The trust between companies has to be there," Jayaraman says.

One way to decide how far to go with suppliers and customers is to analyze the nature of the partnership and make some hard decisions. Is it a small supplier that you can afford to lose?—in which case you might consider dropping it rather than getting stuck dealing with its manual entry work—or is it your most important supplier?—in which case you may do everything short of paying its monthly bills to get it to use your hosted service. Is the supplier's facility totally dedicated to your company, or does it supply other customers from which it draws higher margins on its products?—in which case it may be more resistant to your blandishments.

For example, Imperial Sugar VP and CIO George Muller is trying to help one of Imperial's biggest customers get up and running on some basic EDI transactions (as well as with its SAP rollout), which will lessen manual work for both companies and lay the foundation for an integrated supply chain with Imperial in the future. Because this is such an important customer for Imperial, Muller says he's putting in the hours and providing his expertise for his customer's benefit, doing everything he can to make it work. If the customer were not so important, Muller might not be extending himself to that extent.

—T.W.

matically. If they choose, Agere employees can go into the E2open site to see metrics on how their suppliers' goods are tracking or to look at forecasts.

Those 76 Agere suppliers not yet fully integrated still are able to input their data into an E2open-hosted customized webpage, where they can view all transactions, orders and status. But even when those suppliers add supply chain data to the site manually, Agere's side of the equation stays electronic, with the data flowing automatically into Agere's Oracle system. From Morris's point of view, even if all his suppliers never get to the full integration

stage, it's been worth it already because of the efficiencies gained from working with real-time data, the savings that come with reducing manual-entry errors and the greater systems integration achieved by Agere's suppliers and customers.

Implementing E2open's package only took Agere nine months, which is one of the big selling points of the outsourced, supply chain service providers: faster implementation times with measurable returns on investment.

Ron Vance's investment in E2open was "very modest." "It's not like we put a couple of million dollars into this thing," the CIO



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"E2open shields us from doing the actual integration work ourselves. We don't see any of those problems anymore. Now integration work is E2open's headache."



—Chris Morris, Agere Systems director of IT infrastructure and operations

of Tyco Electronics says. "It's more like a couple of hundred thousand."

Ranga Jayaraman, CIO of Hitachi Global Storage Technologies, says that going with E2open's system versus going with a home-grown one provided his company with a 33 percent reduction in onetime costs.

Staff Liberation Through Hosting

Along with reducing costs (which all CIOs are under pressure to do) and increasing the accuracy of forecasting and tracking (which all business users depend upon), CIOs also want to expend fewer internal IT resources on customization and troubleshooting in order to free up their staffers to work on more strategic projects, says Aberdeen's Enslow.

At Imperial Sugar, an \$800 million sugar processor and refinery, VP and CIO George Muller is running Sterling Commerce's services for order management and inventory. Since going live with Sterling's services in 2004, he's found that his IS staffers are "managing exceptions rather than every transaction. They can," he says, "focus instead on higher-value activities."

For example, whereas Muller's team previously had to find and fix exception transactions that wound up in what Muller calls an "edit and correction bucket," now,

because these exceptions are fewer and more easily identified, his team can focus on development and system enhancement requests that "drive business value versus day-to-day maintenance."

There's another advantage of using an outsourced integration service provider: The hosted front end of an enterprise's supply chain system has the ability to communicate with the different communications protocols found in today's supply chain. Jayaraman says that E2open's ability to translate from one language to another is hugely significant for Hitachi. For example, say a company's systems can communicate only in the "language" of RosettaNet but the company's partners speak in EDI, XML or SAP's iDoc. E2open enables the front-end translation from one language to another and updates the back-end systems as well—which is where current enterprise SCM systems really fall down. As Muller says, "If you're a customer of ours, you can have it your way."

Of Course, Nothing is Ever That Simple

Gartner's Lheureux says that right now he's tracking more than 85 vendors that claim to offer some sort of integration services for all forms of multienterprise integration, including the supply chain. (For a menu of the services available, see "The Hosted Supply Chain Menu," Page 50). Market leaders currently include GXS, Sterling Commerce, Inovis and E2open, and Lheureux estimates the market right now to be worth around \$1 billion.

The first challenge for these vendors will be overcoming resistance from CIOs.

According to an Aberdeen Group survey, CIOs worry about data security, integrating on-demand solutions with internal systems and downtime problems; in addition, they're concerned that outsourcing their supply chain applications will compromise their ability to tweak these applications for individual customers. "As a CIO, I believe I can do things internally as well as turning the keys over to an outsourcer," says Imperial Sugar's Muller. But as he investigated what Sterling Commerce offered, Muller was forced to confront his staff's limitations: "With EDI and VANs, that's just not something I can do. Just like I wouldn't go out and build a general ledger system or a data center."

Another challenge for the integration vendors is signing on enough enterprises to bring on what analysts call a critical mass of suppliers into each vendor's systems and trading hubs. Without that critical mass, CIOs wonder what will become of those vendors and, more important, what would become of their clients if they go under. "If [E2open] can't get that [critical mass], I don't know how they're going to remain in business," Agere's Morris says.

Ironically, the flexibility and ease of integration these vendors provide could also be their downfall because the costs of switching between them become much lower than with traditional packaged application vendors. For Tyco Electronics' Vance, going with E2open wasn't "a bet the ranch proposition. I wouldn't be hard-pressed to bring in another tool to do the same kind of process," he says. "It's a tool; we're not locked in."

While CIOs may not be locked in, many are locking on to this new and more efficient way of doing business with their suppliers and customers. And, given the results so far, no one wants to go back to the bad old days. "It is inconvenient for us to do business in a different way," says Hitachi's Jayaraman. "If we should start faxing things, [our employees] would quit."

"We don't have very many fax machines left." **CIO**

You can reach Senior Writer Thomas Wailgum at twailgum@cio.com. To comment on this article, go to the online version at www.cio.com/101506.

And for You Mid-Market Guys...

The specific challenges of hosting your supply chain software if you're a smaller enterprise is addressed in the article "Meet Your New Host," at www.cio.com/090106.

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The Gaping Hole in Most Document Retention and Deletion Policies

Up to 80% of your document storage could be putting your company at risk

In today's hyper-regulated climate, companies need to enforce a document retention and deletion policy that extends beyond their core data storage infrastructure. In a recent retention and deletion study conducted by CXO Research Services Group, analysts uncovered a disturbing trend about policy makers: Most IT executives continue to focus attention on corporate e-mail and documents stored on servers and mainframes, overlooking about 80 percent of the documents that reside on users' desktops, according to a Gartner study.

If your job responsibilities encompass regulatory compliance, judicial evidentiary requirements or other mandates that apply to managing your company's documents, you need to know whether your company is really equipped to manage this explosion of documents across the enterprise.

"It's clear that for organizations to drive greater compliance and reduce legal risk they must deal with the threat of uncontrolled documents—spreadsheets, word processing documents and presentations", says Darren Lee, president and CEO of NextPage, a provider of desktop document management solutions.

Bob Markham, an analyst for Cohasset Associates and a former analyst for Forrester Research, says, "The greatest weaknesses in document retention efforts stem from inconsistent implementation of standard policies, lack of a coherent document disposal policy and too few users committed to compliant practices."

While the CXO study revealed that most enterprises do have a document retention policy, almost half of them do not actively enforce it. The IT executives surveyed agreed that employee cooperation was critical to the success of any document retention protocol. But they readily admitted that less than 50 percent of their employees actually adhered to the policy.

In the wake of this research, it becomes evident that a majority of companies—across industries as diverse as health care, high tech, manufacturing education, finance, retail and government—are at great risk of

becoming noncompliant, running afoul of discovery requirements in litigation and failing to protect business-critical data that sits on the desktop. While awareness of Sarbanes-Oxley, HIPAA and other legislation was high, 25 percent of the companies surveyed do not have a document retention policy in place nor have any plans to implement one in the near future. With the plethora of regulations that mandate a document management policy continuing to grow, it is more imperative than ever for IT decision makers to address the importance of their business-critical documents everywhere they reside.

Greatest Threat to Businesses:

- 75% E-mail
- 65% Documents (spreadsheets, word processing, documents, presentations)
- 29% Database records

Primary Drivers For Document Policies:

- 61% Regulatory compliance
- 38% Ensuring confidentiality
- 33% Reducing litigation risk

Source: IDG Research. Totals add up to more than 100% because respondents could pick multiple answers.

As an IT executive, it falls on you to develop and keep your company's internal document retention and deletion policies up-to-date. And you need to work with your employees to assure consistent compliance with those policies. Software alone won't solve the problem. You need to find trusted partners to help you develop and implement policies that include not only data stored in corporate data centers but critical documents that reside on the countless desktops scattered throughout your enterprise.

To receive a free copy of the survey results go to www.nextpage.com/cio.

Your end users are downloading Skype and sharing links to company webpages on Del.icio.us. But don't panic. Although emerging consumer applications can pose security risks, here are five that offer business benefits if you manage them well.

BY SUSANNAH PATTON

CONSUMER APPEAL

WHEN PAUL TANG FIRST DOWNLOADED Google's desktop search application, he was impressed by its speed and power. Instead of painstakingly looking for data and files on his hard drive, he could find them with the ease of a Web search. However, Tang, chief medical information officer at the Palo Alto Medical Foundation (PAMF), quickly realized that the slick application could also be dangerous.

Tang saw that this early version of Google Desktop (it was released in 2004) would index encrypted webpages from the hospital's online patient health system, caching the data on his PC. "We take great pains to avoid leaving personal health information on PCs, and we noticed that the search tool was doing that by default," says Tang. Tang

didn't ban the software, but the hospital advised users to change its settings so that encrypted webpages—including those within its medical records system—would be excluded from searches.

Tang isn't as worried now. Google has since changed that default setting, so it no longer leaves cached information on a user's computer, and Tang counts himself an enthusiastic user of the software, among other consumer applications. But as a guardian of patient privacy, Tang knows he has to keep his eyes open for potential vulnerabilities. "Consumer technologies are useful and powerful—and difficult to regulate," he says. "You have to be careful and conscientious about how you use them."

Reader ROI

- Which emerging consumer technologies offer benefits to business
- The risks of letting employees use unapproved software and devices
- How to manage unauthorized applications on the corporate network



The Consumer Tidal Wave

Not long ago, corporations were on the leading edge of technology adoption, providing employees with better equipment and software than they could purchase on their own. Now, however, consumer applications are easy and fun to use, and often free; in many cases, they also work better than corporate software. And the tables have turned on CIOs, as employees download software

from the Internet, bring their handheld devices to the office and merge their home computing life with work. Concerned about losing control of their networks, some IT departments have banned all unauthorized software and electronics from the workplace.

While it's true that consumer technologies such as desktop search, Internet tele-

"You don't want to lose control," says **Fred Pretorius**, IS director with the law firm Mintz Levin. "But you don't want to stifle innovation."

phone services such as Skype and devices such as iPods can weaken network security, the trend is hard to stop. In many cases users are downloading software unbeknownst to the IT department. In a Gartner survey conducted

last year, half of the respondents reported that more than 60 percent of their IT users were employing consumer-grade software, whether approved or not.

Furthermore, employees may be on to something: Emerging consumer applications, when adapted to the enterprise, can make workers more productive and cut IT costs. In fact, Gartner predicts that between 2007 and 2012, the majority of new information technologies that enterprises adopt will have their roots in the consumer market. (For more about the impact of consumer technologies on enterprise IT, see "Enterprise Software Gets a Face-Lift," Page 66.)

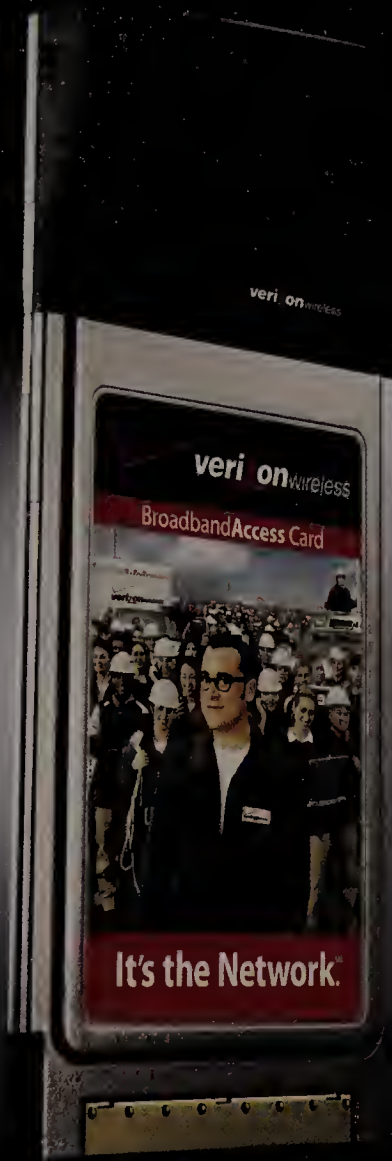
Instead of building a wall to keep consumer technologies out, CIOs need to be pragmatic and provide a place for employees' favorite applications. A willingness to let employees experiment requires management strategies and policies for using external applications that will prevent serious security and privacy breaches. It will also mean, in some cases, making sure networks and architecture are configured to handle

the consumer gadgets and software.

"CIOs are in a balancing act," says Michael Gotta, principal analyst at the Burton Group. "Suddenly there are all of these lightweight, easy-to-use applications that people want to work with, but IT still has to make sure they're meeting security and compliance requirements."

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sumer market, we look at five that are making their way into the enterprise. These technologies—social networking software, Skype, desktop search, handhelds and mashups—exemplify the most important trends in software that will have an impact on business.

Social Networking Software

What it is: Social networking software allows users to interact and share information. Consumer versions of these applications include MySpace.com and Facebook.com, to which the younger crowd flocks to post pictures and network among friends, and LinkedIn, where the professional set keeps up with colleagues and finds out about job openings.

Other popular consumer applications include Flickr, which allows users to “tag” personal photos (a process in which users choose keywords or descriptive terms to classify them), and Del.icio.us, a service for storing Web bookmarks. These sites, both owned by Yahoo, enable users to share their photos and favorite websites. Tagging is sometimes called social bookmarking because

it allows multiple users to categorize online content.

A few software companies, including Contact Networks and Visible Path, offer corporate applications that mirror these consumer sites, promising to help business users organize and find information.

Business benefits: In two words, knowledge management. Corporations have struggled with KM for years, trying to get employees to share information. Now some companies are experimenting with social networking applications, hoping employees will adopt them if they see these systems are easy to use and deliver benefits quickly. Other companies are working on ways to help employees find data more easily by adopting tagging technology such as that used by Flickr.

At the Boston law firm Mintz Levin, attorneys search for contacts on the firm’s intranet using Contact Networks’ software. Fred Pretorius, Mintz Levin’s director of IS, says he decided to give the enterprise social networking software a try two years ago, after attorneys complained about floods of messages from colleagues that would begin, “Does anyone know...?” Now, the firm’s 475 lawyers can search for contacts within the firm from a link on the company intranet page.

Pretorius provided Contact Networks with the firm’s global address list, and the software company then installed the application on an existing server. The harder part, he says, was convincing attorneys to expose their client lists. “This was a huge cultural obstacle because contacts are what defines their work,” Pretorius says. At first, 20 percent of the attorneys opted out of the system. As they began to see how it could help them, however, that resistance began to fade. Now, 99 percent of Mintz Levin attorneys use the system.

In addition to sharing personal information and contacts, companies are also trying out ways to organize corporate information using employee-generated tags, or keywords. Tagging makes information easier to find than is often possible on a corporate intranet. “I know of no organization that has an intranet that works well for everybody finding what they need,” says Thomas Vander Wal, founder and senior consultant for InfoCloud Solutions. (Vander Wal created the term *folksonomy*, which refers to a tagging system created within an Internet community.)

Mitre, a nonprofit research and development company, is experimenting with tagging using a customized application that was built on an open-source tool called Scuttle. The pilot project, dubbed “onomi,” is similar

Enterprise Software Gets a Face-Lift

Consumer IT provides the model for new business applications

ENTERPRISE SOFTWARE, look out. The hard-to-install, hard-to-use software of the past is quickly becoming a dinosaur. “The way that consumers use software is bleeding into the enterprise,” says Paul Holland, general partner at Foundation Capital, a venture capital company. That means that more companies will be choosing on-demand software akin to Salesforce.com for nonstrategic tasks. It also means that users will expect business applications to be as easy as the ones they use at home.

“In the past, enterprise software was hard to use and people got discouraged,” Holland says. “Users are driving the trend—they are the new heroes of the organization.”

Just ask Roger Hoffman, director of technical service management at car research site Edmunds.com. Employees at Edmunds.com have been using an on-demand application called Service-now since February to log incidents, changes or problems with the production environment. Service-now was inspired by business-to-consumer software such as home banking applications, Google and Amazon.com. Hoffman says he is pleased so far and that users are happy with the easy-to-use interface.

Hoffman adds that users are increasingly looking for simple applications and attractive interfaces that mimic the software they use at home. Software vendors are taking note, following the lead of such vendors as Rearden Commerce, which enables customers to order business services online. The trend is even drifting into supply chain applications. The startup Ketera Technologies offers an on-demand procurement application that promises companies it will “consumerize” purchasing and make ordering supplies as easy as ordering something from Amazon.com. —S.P.



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to Delicious in that it allows employees to share annotated bookmarks. Donna Cuomo, chief information architect with Mitre's center for information and technology, says the idea arose after she noticed that employees were using Delicious and Flickr to share company information. So far, 900 of Mitre's 6,000 employees are using onomi to organize their own bookmarks and share them with colleagues. "A lot of people have adopted it as the only way they want to share resources," Cuomo says.

The risks: As consumer technologies go, social software poses few major risks. Employees may use consumer social networking sites for business purposes, sharing photos on their corporate blogs using Flickr or posting company information on LinkedIn. If employees start using such applications under the radar, however, there could be confusion about where and when it's appropriate to share information. Mitre's Cuomo says that she

feels more comfortable using an internal tagging system because employees won't be putting links to company information outside of the firewall.

2 Skype

What it is: Skype is one of a slew of applications in the emerging voice over IP telephony market that allow users to engage in voice and instant messaging conversations with each other. (Phone calls via Skype are free when made to another Skype user.) It has emerged—mainly through word of mouth—as one of the most successful Internet applications of all time, with more than 300 million downloads and more than 100 million registered users. Skype was acquired by eBay last year for \$2.6 billion. Competitors include AOL's AIM Triton and Microsoft's Windows Live Messenger.

Skype's appeal is that it's easy to use and the quality of its voice service is high. "It's better than most VoIP products out there," says Steve Cawley, CIO with the University of Minnesota, where he suspects Skype is popular among international students and researchers.

Business benefits: VoIP technology offers huge cost savings over traditional telephone service, especially for companies that make a lot of long-distance calls or have employees working in places subject to high long-distance fees. Skype and applications similar to it can also help companies that haven't yet deployed VoIP create a converged communications suite, including voice, video and instant messaging, writes Irwin Lazar, an analyst with Burton Group, in a report about the technology.

For example, Lazar says, many Burton Group employees use Skype for internal and external communications. At first, most were motivated by cheaper long-distance calls. But many are now using it for instant messaging. Saul Klein, vice president of marketing with Skype, says 25 percent to 30 percent of its customers use the application for business. In the corporate environment, Skype poses some security risks (see below). But

companies, especially small ones, that are more focused on cost savings than security may be willing to take that risk. Even CIOs at some larger companies such as Greif, a maker of industrial packaging products, report

Paul Tang, chief medical information officer with the Palo Alto Medical Foundation, allows managers to use PDAs to read e-mail that isn't patient-related.





I.T. NIGHTMARES

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_NIGHTMARE #1: 9:05 a.m.

_The office is buried in quicksand—infrastructure quicksand! Our indecision about how to move to a service oriented architecture is sinking us. How do we start? Can we reuse what we have? Can we integrate our existing apps like SAP and Oracle? We're sinking fast!





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_NIGHTMARE #2: 10:33 a.m.

_I feel like I'm being chased by a relentless horde of regulators. It must be these compliance regulations. They're killing us! Audits. Inconsistencies. Processes. Time. Money.

_RUN, GIL, RUUUUUN! Gil, you have to run faster than a power walk!

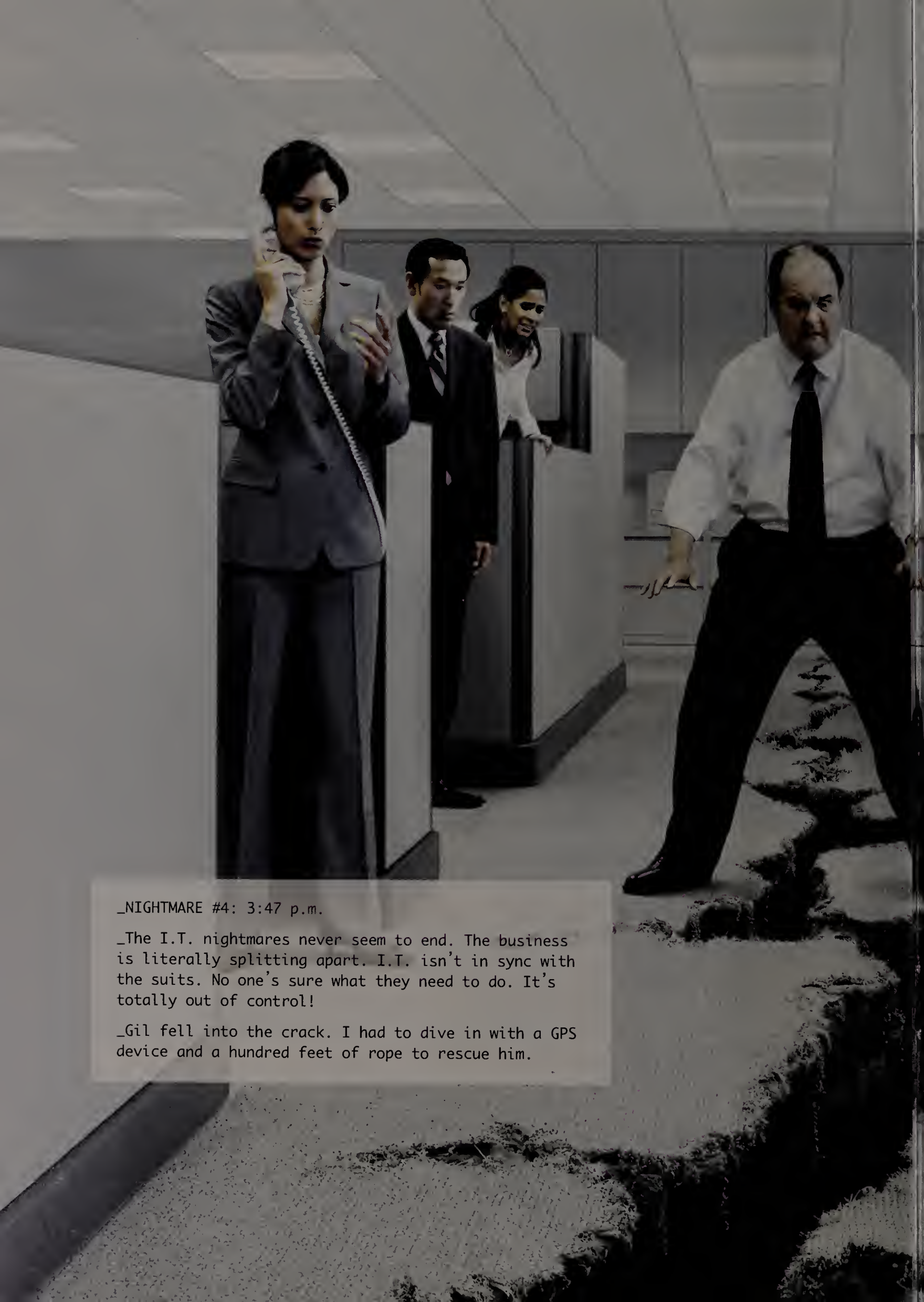


_NIGHTMARE #3: 12:05 p.m.

_Our lack of productivity is out of control! No one can get anything done. What we're using isn't working. Gil's had enough. He moved everyone into one cubicle so people would be forced to collaborate. He calls it a "collaboration" cubicle. Hey, who sat on my sandwich? That's not funny, my mom made that for me.

IBM®





_NIGHTMARE #4: 3:47 p.m.

_The I.T. nightmares never seem to end. The business is literally splitting apart. I.T. isn't in sync with the suits. No one's sure what they need to do. It's totally out of control!

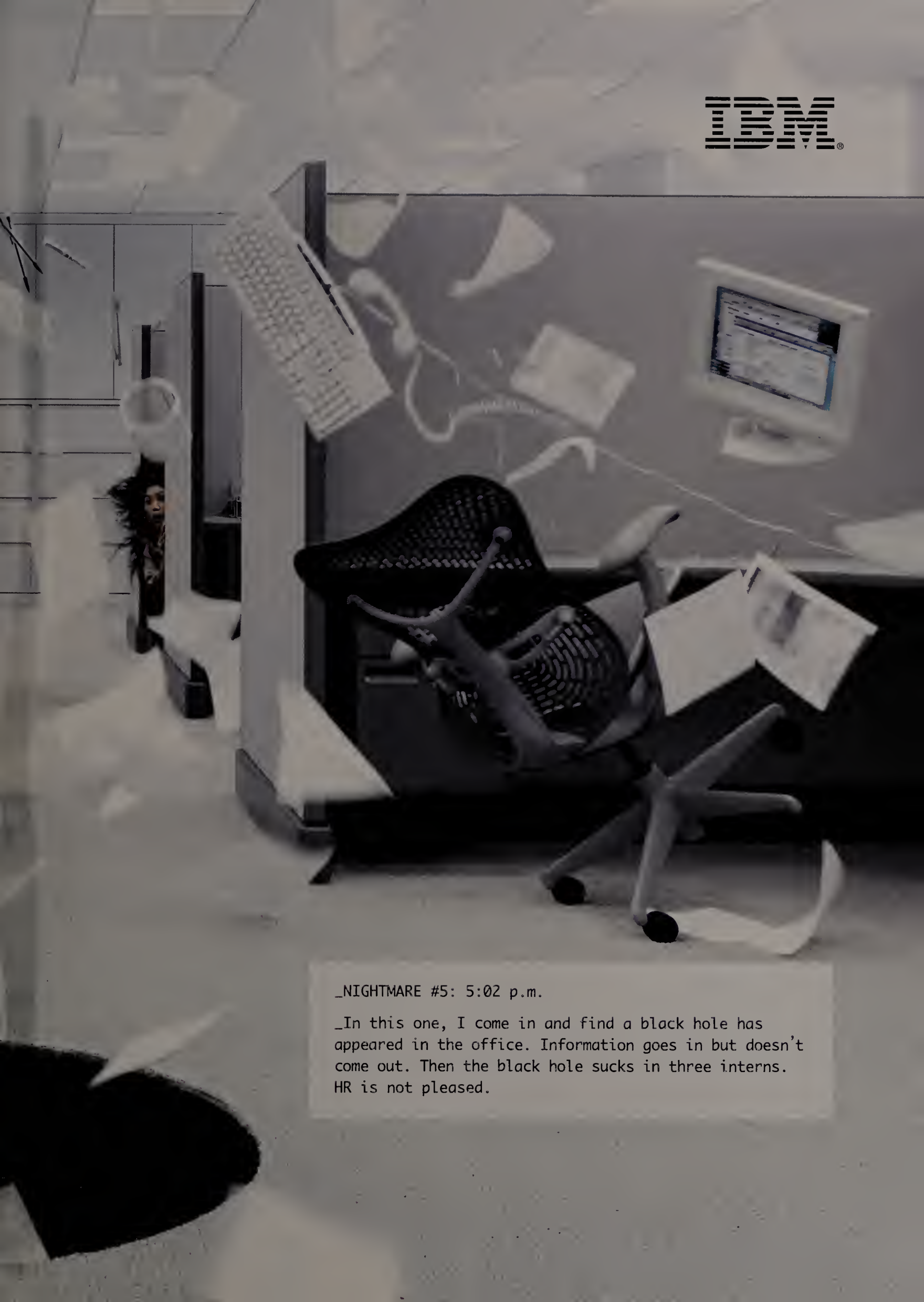
_Gil fell into the crack. I had to dive in with a GPS device and a hundred feet of rope to rescue him.



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_NIGHTMARE #5: 5:02 p.m.

_In this one, I come in and find a black hole has appeared in the office. Information goes in but doesn't come out. Then the black hole sucks in three interns. HR is not pleased.



_5:29 p.m.

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Be Seen Winners will also be honored at the third annual **CIO Leadership Conference** to take place April 29–May 1 at the Hyatt Huntington Beach in Huntington Beach, California.

Don't Be Late We will accept nominations from Sept. 1 through Nov. 15. For more about this prestigious award, go to www.cio.com/awards.

that they are willing to test Skype and aren't overly concerned with potential security risks.

The risks: As with any application exposed to the Internet, "the potential that some flaw will be discovered that would enable an attacker to either gain control of or disrupt a Skype user's computer or mobile device is real," notes Lazar. (In general, VoIP can pose a security risk because calls travel over data lines that may be vulnerable to Internet worms and viruses.)

These risks are magnified in the case of Skype because, unlike with enterprise VoIP systems from vendors such as Cisco and Avaya, there's no way to track who is using Skype or how it is being used. That's because it can be downloaded and installed by employees themselves.

Finally, Skype can't log and monitor phone calls, so companies that have to track calls for compliance purposes may want to avoid

indexes everything on their hard drives in the same way that Google indexes the Web. The software can be set to return results on e-mail, text files, spreadsheets, photos, PDFs and more.

Business benefits: Desktop search can make work easier and increase productivity, especially for employees in industries such as biotechnology who need to find technical information quickly to do their jobs. Palo Alto Medical Foundation's Tang says that even though initially he had concerns about the security and privacy implications of desktop search, it can be a valuable tool if users know how to protect their information.

Tang and other CIOs see desktop search applications growing in popularity, and they are putting together policies to determine when these tools can be used. Chris Holbert, CIO at Launchpad Communications, which operates an inbound sales call center in Los Angeles, says he currently sees no business need for desktop

search. However, Holbert worked for seven years as head of IT at a biotech firm, where researchers made frequent use of a customized desktop search tool. Even some CIOs who currently ban desktop search applications say they are preparing for the day when they might have to change their position. "Desktop search seems to have a lot of momentum and we won't be able to ignore it," says James Kritcher, VP of IT at White Electronic Designs.

The risks: Company data may be exposed inadvertently. Once the tool is installed and files are indexed, a snoop can theoretically search someone's hard drive for information. At PAMF, Tang went out of his way to help users understand how to make sure that sensitive data doesn't

get indexed, but freewheeling users may not always pay attention. Google's desktop search software also has a feature that lets users search for content on multiple computers. The "search across computers" feature stores copies of PDFs, Word files, spreadsheets and other documents on Google servers. In theory, Kritcher points out, storing documents even temporarily on an external server could expose a company to litigation for violating its privacy, security or document retention policies.

"Consumer technologies are useful and powerful—and difficult to regulate. You have to be careful and conscientious about how you use them."

—Paul Tang, chief medical information officer at the Palo Alto Medical Foundation

it. Pharmaceutical company Novartis has banned it, and schools including Oxford University and the University of Minnesota have issued warnings against using Skype.

Minnesota's Cawley also discourages using Skype because of the security risks. He worries about the capability for Skype users with a public IP address to become "supernodes," acting as hubs that route calls for other users. In the meantime, he suggests that users pick another VoIP service, such as Free World Dialup, which has clients for Windows, Mac OS X and Linux. And although students and faculty can use Skype if they choose, they are asked to turn the application off when they are done calling. "If we do see a problem with Skype, we may go ahead and block it," says Cawley.

Desktop Search

What it is: A free tool offered by Google, MSN, Yahoo and others that allows users to quickly search the contents of their hard drives. The latest version of Google Desktop can also be used to share files between computers. Users download the tool, which

Handheld Devices

What they are: Pagers, cell phones, iPods and PDAs have been around long enough that plenty of companies sanction them for everyday work (think BlackBerry). The devices are becoming so entrenched in daily life that lots of people (including you, probably) bring their own devices from home too.

Business benefits: While at many companies handheld devices are disdained as providing little more than a distraction during meetings, early adopters of the technology on an enterprise

A large iceberg floats in a dark, choppy sea. Only the tip of the iceberg is visible above the water, while the vast majority of its mass is submerged beneath the surface. This visual metaphor represents the 'hidden 80%' of unstructured information within an enterprise.

Understanding the hidden 80%

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scale use them for more than idle chat or diversion. A doctor in Geneva, for example, has reportedly devised a software program that allows physicians to view medical images on their iPods.

At Mintz Levin, IS director Pretorius is testing a proposal from an associate suggesting that the firm build a podcast library of attorneys' legal presentations. Some managers at the PAMF use PDAs to read e-mail that is not patient-related, look up information about drugs and check medical protocols.

The risks: Mobile phones and PDAs are usually not password protected; therefore, companies risk compromising corporate data if it is downloaded onto the devices. The same goes for iPods, which can be used as backup storage devices. Data security standards set by the Payment Card Industry Security Standards Council could prohibit most pagers and cell phones from being used in offices where information about cardholders is known by employees, such as in call centers or at e-commerce sites.

Mashups

What they are: Mashups are applications that combine data from two or more online sources and run within a Web browser. Think of mashups as Web services lite. Mashups were born a little more than a year ago when Paul Rademacher, an animation expert at Dreamworks, created HousingMaps.com, which merged Craigslist and Google Maps to help people locate real estate listings. Since then, mashups have gained ground among developers; there's competition to create the most innovative applications. One of the most talked about mashups is the combination of Google Maps and the CRM application Salesforce.com.

Business benefits: Mashups offer faster and easier integration of some services than may be possible using Web services within a service-oriented architecture (SOA). Mashups are less complex, and developers concern themselves less about complying with technical standards because the applications are browser-based, according to consultant Dion Hinchcliffe, president and CTO with Hinchcliffe & Co.

One way mashups are making inroads into the enterprise is when corporate developers adopt the mashup approach for integrating data internally, says John Musser, a consultant who operates the website Programmableweb.com. Investment management company T. Rowe Price, for example, has combined data from multiple applications in order to simplify its call center systems. Kirk Kness, VP of architecture and strategy at the company, says he prefers to call the development technique "composite applications," because "the term mashup implies that we might be winging it, and we're not doing that." Kness and his team are using portal software from IBM and Ajax, a development methodology for generating interactive Web applications.

Meanwhile, IBM is working on a project called QEDWiki (so called because it uses wikis, a tool that

allows multiple users to edit a webpage) that is designed to let businesspeople create their own webpages by dragging information from both private and public websites. Using QEDWiki, an employee could integrate weather data, information from an ERP system and the location of company facilities in a single webpage.

"Companies have been wrestling with integration for decades," says Musser. "Mashups offer a whole new level of power and sophistication that comes for free."

The risks: These applications can have a lot of security holes. Some mashups that use Ajax scripts, for example, expose their code in the browser, which may allow the mashups to be used maliciously. What's more, passwords for accessing components of a mashup may also be exposed in the browser, putting the underlying services at risk. Hinchcliffe says that many mashups pull code in live from the Web (think of any service using Google Maps) and run without being previously tested. The danger there, he says, is that the code from an underlying source could change the next time the mashup is loaded, and users won't know what's in it.

How to Manage the Consumer IT Invasion

There are several steps CIOs can take to manage consumer technologies as they make their way into the enterprise:

► **Find out what's happening.** By determining which consumer technologies are popular with employees and why they want to use them, IT leaders can figure out the best ways to adapt them internally. Some technologies that have taken off on the consumer side already have offshoots better suited for enterprise use. For example, Google Desktop 3 for Enterprise, currently in beta, allows administrators to disable features they don't want employees to use. X1 Technologies, which has partnered with Yahoo, offers a competing enterprise search tool.

► **Identify and mitigate risks.** If employees need a particular technology to do their work, companies might need to shore up their network security or add bandwidth to support it. If a company allows the use of Skype, for example, it will want to block unsolicited incoming connections to Skype clients to discourage malicious activity.

► **Govern usage.** If you're going to ban an application, set up controls to prevent it from slipping in. Among the options: identity management systems, network access controls and intrusion prevention. "Rather than trying to create a secure perimeter and keep the consumer technology out, you should assume a hostile environment and drive security deeply and broadly into everything you do," says Gartner analyst David Smith.

If you're open to experimentation, make sure users know how far they can go. "You don't want to lose control with what's happening on your network," says Mintz Levin's Pretorius. "But at the same time you don't want to stifle creativity and innovation. Balancing the concerns and benefits related to consumer technologies is a constant battle, but I see it as a major part of my job going forward." **CIO**

Consumer IT in the Enterprise

Senior Writer Ben Worthen blogs about WHY CONSUMER I.T. IS BETTER in Net Effect. Find his postings online at www.cio.com/101506.

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Susannah Patton is a writer based in California. To comment on this article, go to the online version at www.cio.com/101506.

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The Complying Game

CIOs are still struggling to comply with HIPAA's 10-year-old medical privacy regulations. And the smaller the healthcare organization, the harder the task.

BY SUSANNAH PATTON

In

2001, Ron Uno, manager of information management at Kuakini Health Systems, made the decision to move his hospital's medical records system from paper to computers. The main motivation for the costly, multiyear project? The Health Insurance Portability and Accountability Act, or HIPAA, the then five-year-old federal law that sets standards for protecting the security and privacy of American medical records. If the hospital had an electronic medical records (EMR) system, Uno reasoned, it would be easier to monitor who was accessing sensitive patient information and to comply with the law's privacy and security regulations.

Reader ROI

- Why HIPAA compliance is the exception, even though it's a rule
- Tips for containing compliance costs

Five years later, Uno is halfway through implementing an EMR system. He estimates that Kuakini, a nonprofit with \$275 million in revenue that operates a 250-bed hospital and a 200-bed long-term care facility in Honolulu,

has spent \$10 million to \$15 million on implementing the system and other technologies to help it comply with HIPAA. "Even though we're a small hospital, we're trying to comply as much as we can," says Uno, who is closing in on full HIPAA compliance, though he's not there yet.

The Long, Hard Road to Compliance

A decade after HIPAA was signed into law, CIOs like Uno are still struggling to comply with its provisions. Some lack the resources to fully meet the



HIPAA helped drive the decision to move patient data from paper files to an electronic medical records system, says **Ron Uno**, manager of information management at Kuakini Health Systems.

requirements of this complex set of rules; others seem to feel little need to hurry since the federal government has not aggressively enforced the law. So it comes as no surprise to learn that HIPAA compliance rates appear to be slipping.

Fewer hospitals and healthcare facilities are fully complying with the law this year than in 2005, according to a recent survey by the American Health Information Management Association (AHIMA), a professional organization for health information executives. And more than one-quarter of U.S. security executives whose organizations need to be HIPAA-compli-

ant admit that they are not, according to "The Global State of Information Security 2006," a study released last month by CIO and PricewaterhouseCoopers.

These findings stand in sharp contrast to the billions of dollars invested by healthcare CIOs in technologies to protect medical records, including EMRs, firewalls, remote monitoring systems, intrusion detection, auditing software and encryption programs. HIPAA compliance rates declined across institutions of all sizes, but specialists say the problem is most acute at small to midsize hospitals with their limited budgets. "Smaller hospitals with

thinner margins and smaller IT budgets will have a more difficult time being compliant," says Gartner analyst Robert Booz.

There is no question that HIPAA has made patient information more secure. It also accelerated adoption of healthcare IT systems nationwide, an evolution that is boosting efficiency while reducing medical errors. Getting there, however, hasn't been easy.

Asif Ahmad, CIO and VP of diagnostic services at Duke University Health System, says that HIPAA compliance has created extra burdens, even for large healthcare organizations such as his own. "I can't imagine a community hospital coming up with all of these resources," he says.

Uno agrees that it is harder for smaller organizations to secure the resources and support to fully comply with HIPAA. But it can be done. Uno sold his senior management team on the importance of compliance by stressing that failure to meet HIPAA requirements could lead to privacy breaches. "No one wants to be the scapegoat for a privacy breach," he says.

The Silent Crisis

HIPAA was introduced in 1996 as a broad measure designed to protect confidentiality and security of health data. It called on the Department of Health and Human Services to standardize electronic patient health and financial data and to set security standards to protect "individually identifiable health information." The law, which applies to all healthcare providers and health plans, as well as insurers, technology vendors and universities, put in place a series of mandates and deadlines. Perhaps the most important to healthcare CIOs were the privacy rules, which took effect in April 2003, and the security rule, which had an April 2005 deadline.

While HIPAA offers a framework for how healthcare organizations need to safeguard data, it does not provide recommendations for specific technologies to do the job. This lack of detail meant that healthcare CIOs scrambled in the early years to get ready for the deadlines. They invested in hardware and software, in addition to training staff on safe ways to access and transmit personal health data.



Rick Gasteel, VP of MIS at Upper Chesapeake Health: "I would avoid vendors that bill themselves as HIPAA-compliant."

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More recently, however, the focus has shifted away from compliance, say specialists. "The healthcare industry has spent billions on HIPAA compliance, and now what we're seeing is HIPAA fatigue," says Gartner's Booz.

Nearly 39 percent of hospitals and health systems reported full privacy compliance this year, according to AHIMA, which surveyed 1,117 healthcare privacy officers and others whose jobs relate to HIPAA privacy. That's up from 23 percent in 2004. However, the number of those

who believe they are more than 85 percent compliant dropped to 85 percent in 2006, down from 91 percent in 2005. (For more information, read the full AHIMA report, "The State of HIPAA Privacy and Security Compliance." Find a link to the report at www.cio.com/101506.)

"This is not a crisis, but more of a silent erosion of HIPAA compliance," says Dan Rode, VP of policy and government relations at AHIMA. "It's a wake-up call."

After the rush to implement privacy and security systems, he says, many institutions now report that support and resources from healthcare organizations are declining in the face of budget constraints. Also troubling to some privacy advocates is what they see as the federal

government's generally lax attitude toward HIPAA enforcement.

According to the Health and Human Services Office of Civil Rights, which enforces the law, more than 22,000 grievances have been lodged since the HIPAA privacy rule took effect in 2003. Most have to do with personal medical information being wrongly revealed. The government has closed 75 percent of these cases, either ruling that there was no violation or no jurisdiction, or after ensuring that hospitals, health plans or doctors' offices had fixed violations. To date, no fines have been assessed by the department. Out of 339 complaints referred to the Justice Department for possible criminal prosecutions since the privacy

Continued on Page 82

A HIPAA Loophole?

Privacy rules don't always cover popular personal health records

In 1999, WebMD started offering an online "personal health record," or PHR, to help consumers record, store and transport their medical information to any doctor or hospital. Today, the \$168 million provider of online healthcare information works with clients such as Microsoft, Starbucks and health benefits company Wellpoint to gather employee health information and import insurance claim data into the personal digital records.

PHRs offer numerous advantages. For example, Microsoft employees can go to their company's healthcare portal to conduct online health risk assessments and create personal health records. They can also find healthcare providers in their area and some even have the ability to incorporate information from labs and other sources into their record. Over the past several years, smaller companies including FollowMe, Laxor and Medem have sprung up to offer similar services. PHRs are not replacing EMRs but they are growing in popularity, especially since large corporations have started offering them to employees.

As interest in PHRs grows, however, some doctors and privacy advocates question whether such digital repositories are covered by federal privacy regulations. "Organizations that operate the PHR may not be covered by HIPAA," says Paul Tang, VP chief medical information officer at Palo Alto Medical Foundation. "The people who own the databases that hold your medical records are not regulated by HIPAA in terms of what they do with the data." Tang's concern is that third-party PHR providers are not technically governed by HIPAA so they don't have to comply with it, even though many say they do.

A spokesman for the Department of Health and Human Services acknowledges that PHRs are not technically covered by HIPAA. However, organizations that maintain PHRs and are them-

selves covered under HIPAA (health plans and healthcare providers, for example) are subject to compliance. But certain types of entities that provide PHRs may not be covered by HIPAA. HHS is examining privacy and security issues related to PHRs, and considering what steps need to be taken.

Craig Froude, WebMD's executive vice president of health services, says PHRs are private and secure because the companies that WebMD works with are covered under HIPAA. "We're compliant and our clients are compliant," he says. WebMD's privacy policy states that it abides by HIPAA guidelines, even though it is

not technically covered by the regulation. This means that WebMD agrees not to sell or release personal healthcare information.

However, other PHR providers may not have such stringent privacy guidelines. "As a consumer, you will need to read the privacy policy of any group providing a PHR," Froude says.

There needs to be greater legal protection of patient data in PHRs, says Dan Rode, vice president of policy and government relations for the American Health Information Management Association, a professional organization. Now, he says, it's not always clear whether the data is protected under HIPAA.

"People need to have clear rights as to who has access to their medical records," Rode says. His organization is finishing a position statement calling on providers of PHRs to make it clear who has access to their data.

—S.P.

**Third-party
PHR providers aren't
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by HIPAA so they
don't have to comply
with it, even though
many say they do.**

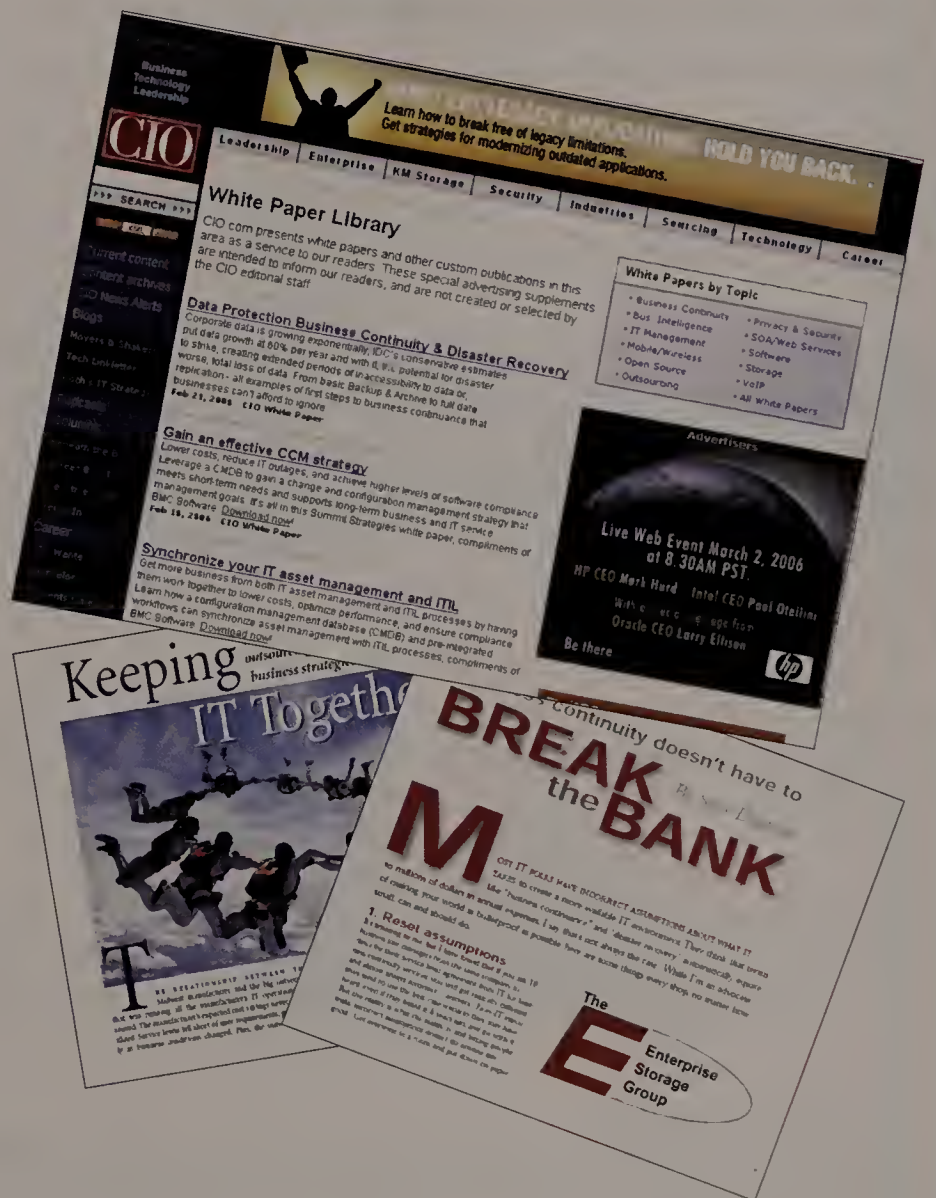
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Sunday, November 5, 2006

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8:00 AM - 1:30 PM

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CIO Executive Council

Open House 3:30 PM - 5:00 PM

Join the CIO Executive Council staff to expand your network of CIO peers and learn about the current initiatives, including demos of the IT Value Matrix & Knowledge Center and Strategic CIO Benchmark.

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6:00 PM - 7:00 PM

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Throughout CIO|07 The Year Ahead

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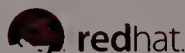
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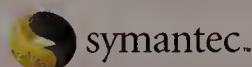
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► Key Topic Highlights

By attending these thought provoking sessions over *CIO's* two-day conference, senior IT executives will be able to:

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- learn how to respond decisively to each major challenge
- interact with the best strategic thinkers in the business

Monday, November 6, 2006

8:15 AM - 9:15 AM

KEYNOTE: Polishing the Crystal Ball: Predictions for the Economy

9:15 AM - 10:00 AM

How the Next Generation Views and Uses Technology

11:55 AM - 12:40 PM

Confronting Global Demographics: Prospering Despite a Workforce Shortage

2:15 PM - 3:00 PM

Working Better Together: The CEO-CIO Partnership

3:00 PM - 4:00 PM

Scenario Planning For Disaster: Interactive Exercises, Part 1

4:15 PM - 5:30 PM

Scenario Planning For Disaster: Interactive Exercises, Part 2

Tuesday, November 7, 2006

8:30 AM - 9:30 AM

KEYNOTE: Changing Your Business Model: The Message of "The Long Tail"

9:30 AM - 10:15 AM

When CIO Also Means Chief Innovation Officer

11:25 AM - 12:05 PM

A. Demographics: Building Digital Cities, Digital Citizens
B. Technology: The Next Generation Internet and its Impact around the World

12:10 PM - 12:50 PM

A. Demographics: Going Green: The Role of IT
B. Technology: An Insider's Look at Emerging Technologies

2:20 PM - 3:05 PM

FORUM: Preparing For Tomorrow's Enterprise Architecture

3:05 PM - 3:50 PM

KEYNOTE: Privacy: The Road Ahead

► Conference Speakers

Conference Moderator:

Jonathan Zittrain, Professor of Internet Governance and Regulation, *Oxford University*

Speakers:

David Aronoff, General Partner, *IDG Ventures*

Jerry Bartlett, CIO, *TD Ameritrade*

Gary Beach, Publisher, *CIO magazine*

Asheem Chandna, Partner, *Greylock Partners*

Joseph Franz, Director, Information Technology, Sales and CRM, *Constellation Energy*

Kevin Gallagher, Ph. D., Assistant Professor, College of Business, *Florida State University*

Lev Gonick, Vice President for Information Technology Services and CIO, *Case Western Reserve University*

Radford Jones, Academic Specialist, School of Criminal Justice, *Michigan State University*

Vince Kellen, Vice President, Information Services, *DePaul University*

Abbie Lundberg, Editor in Chief, *CIO magazine*

Carrie Mathews, Program Manager, *CIO Executive Council*

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rule took effect, only two have been prosecuted fully under HIPAA.

Unlike those who have run afoul of Sarbanes-Oxley, HIPAA violators have not faced high-profile prosecutions that would encourage compliance. “There haven’t been any ‘perp walks’ before news and television cameras,” says Peter Cizik, CEO of consultancy HIPAA Solutions Rx.

Although HIPAA violators are unlikely to get into trouble with the federal government right now, they should strive to comply in order to avoid running afoul of state and federal privacy laws or getting involved in costly class-action lawsuits, says Cizik. He notes that HIPAA provides a “floor” for

the Oregon attorney general’s office. “Health care is a ripe target for identity theft,” says Cizik, himself a victim of the Providence breach. He notes that the company spent millions to pay for ID theft protection services and to defend against a class-action lawsuit filed on behalf of former patients.

“For some organizations, unless they think it can happen to them, they won’t take all the necessary steps to keep their information secure,” adds AHIMA’s Rode.

A Plan for Action

As a consultant for HIPAA Solutions Rx, Ross Leo travels the country to help hospitals and healthcare systems achieve compli-

recommends the addition of or upgrades to security systems. These can range from basic firewalls to more sophisticated EMRs, depending on the hospital’s budget.

Even when a hospital or clinic can’t afford large-scale technology investments, Leo says that changes to IT policies can help bring them toward HIPAA compliance. For example, Leo worked with IT and security staff to develop policies for safe use of the Internet at a midsize Chicago hospital that was starting to deploy PCs with online access at workstations. He recommended that the hospital ban access to patient data on these PCs except in certain cases. Leo also suggested barring remote access to the patient information database for doctors and other staff members who log in from personal computers or laptops.

Leo says minor changes in procedure can make a big difference in protecting patient data. For example, a fax machine placed at a nurse’s station can reveal patient information to anyone walking by. “People usually think their processes are OK when they’re not,” he says.

Taming Costs

Cost is a major stumbling block for CIOs determined to bring their organization in line with HIPAA. In fact, the AHIMA survey found that 55 percent of respondents identified resources as their most significant barrier to full privacy compliance.

When Kuakini’s Uno started looking for an EMR system, he knew cost would play a key role in his decision. EMRs are not required under HIPAA, but they make it much easier to comply. Where other facilities in the Honolulu area have spent \$35 million to \$40 million implementing EMRs, Uno would have to get by on a much smaller budget—approximately \$15 million. So when he chose Cerner to provide the EMR, he negotiated carefully with his longtime vendor to make sure he could complete the project on his limited budget.

“We examined each contract line item with a fine-tooth comb to see if it was really needed or if we could find an alternative. There were items included that we didn’t need, such as a standalone [uninterruptible power supply],” says Uno. “[Eliminating] it saved us a lot of money. The bottom

Toolbox

Technologies to help achieve compliance

HIPAA compliance is a goal all healthcare CIOs need to reach. Experts say the technologies listed below are a key part of a successful compliance effort.

TECHNOLOGY	VENDORS
E-mail encryption	PGP, Postini, PostX, ZixCorp
Electronic medical records	athenahealth, Cerner, eClinicalWorks, Epic, Misys, NextGen, Tripwire
Single sign-on and access control	Passlogix, SentillionVergence
Firewalls and intrusion detection	Check Point, Cisco PIX, SonicWall
Remote auditing and monitoring	Arcsight

—Compiled by Katherine Walsh

minimum standards of privacy and security and that if state laws are more stringent, they will prevail. In California, for example, any organization doing business there must notify all individuals affected by a breach of personal information.

The widespread damage that a privacy breach can cause in the healthcare arena came to light this year when Providence Home Services, a division of Seattle-based Providence Health Systems, revealed that backup computer tapes and disks containing personal information and medical records on 365,000 patients were stolen from a parked car. In addition to suffering public embarrassment, the healthcare company paid to inform all its patients via mail and offered to pay for credit monitoring services. The data theft is under investigation by

ance. Many small and midsize facilities he works with are struggling to pay for system upgrades; still others are moving slowly “in order to be seen as not ignoring HIPAA.”

Leo feels their pain: He oversaw a HIPAA compliance program as CISO and director of IS for the managed care division at the University of Texas Medical Branch in Galveston. Some of his clients can’t afford the leading-edge technology to track access to patient information.

Leo suggests that companies in this situation start their compliance efforts by drawing up a “risk mitigation plan” that outlines weaknesses in IT security and staff procedures for guarding data privacy. Such a plan can help the CIO pinpoint what needs to change and where to target investment.

After a risk analysis assessment, Leo

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line? You need to know how each item fits in the project infrastructure.”

To help implement the EMR system, a six-member in-house IT team works in concert with the Cerner consulting staff. Uno says this approach has helped Kuakini realize significant cost savings and better monitor the project.

“Foremost in my mind during this process was the fact that we are not a rich hospital,” says Uno. “We formed a partnership with Cerner and keep constant tabs on the cost of the project.”

The cost of compliance is also on the

healthcare provider reach compliance.

“We were looking for vendors who would show us how we could use their tools to meet compliance requirements,” Casteel says. For example, a partnership with Trigeo helped Casteel’s team see how valuable system-wide log management could be in relation to HIPAA and how the vendor’s tool fit into the healthcare provider’s IT infrastructure.

In that way, Casteel says, he has avoided excessive spending on all new HIPAA security and privacy systems. One key to success, he says, is to avoid hype from vendors looking to sell new products.

“I would avoid vendors that bill themselves as HIPAA compliant,” he says, noting

several lesser provisions remain to be implemented. For example, the deadline for healthcare organizations to start using a “national provider identifier” (NPI) is next May. The NPI is a unique health identification number that will be assigned to healthcare providers to simplify communication between providers and health plans and to cut the risk of fraud.

Compliant at Last

Uno intends to keep fine-tuning his systems to bring Kuakini in line with HIPAA. It’s been a long road but compliance appears to be just around the corner.

By the first quarter of 2007, Uno says,

Out of 339 complaints referred to the Justice Department for possible criminal prosecutions since the privacy rule took effect, only two have been prosecuted fully under HIPAA.

mind of Rick Casteel, VP of MIS at Upper Chesapeake Health, which has revenue of \$162 million and operates two hospitals in Harford County, Md. Casteel started preparing for HIPAA six years ago. He considers HIPAA an essential foundation for assuring security and privacy of medical data but one that is complex and demands constant attention and dollars. Casteel wouldn’t specify how compliant Upper Chesapeake is with HIPAA, but says he is comfortable that “we have balanced electronic security well against the demand for data and the need for quality and safety.” Like Uno, he is always looking to contain his compliance costs.

Casteel started his organization’s compliance effort with a complete inventory of existing tools such as firewalls and other security software programs. Upper Chesapeake undertook this assessment utilizing a Web-based tool from Xpediate. The tool provided a structure for an in-house inventory while allowing Casteel to use internal resources rather than bring on additional staff or hire expensive consulting assistance. After completing the inventory, Casteel went to his current vendors and worked with them to find different versions of software that would help the

that HIPAA provides a framework and does not require specific vendors or products.

Looking Ahead

HIPAA has pushed IT executives like Uno and Casteel to move forward with EMRs and other technology initiatives that make it easier to audit access to sensitive patient data. However, such systems also create new risks and new demands on IT.

“I’m required to give more people access to more data,” says Casteel. This increased access provides more opportunity for data to escape. “Privacy breaches are what keeps an IT manager up at night,” he adds.

Healthcare CIOs have another reason to focus on keeping their data private and secure. In 2004, President George Bush charged the IT and healthcare industries with building a National Health Information Network (NHIN), a system to provide every citizen with an electronic medical record by 2014. He appointed Dr. David Brailer to coordinate the effort. Brailer resigned in April but the Department of Health and Human Services is pressing ahead with NHIN.

Looking forward, Uno and Casteel agree that the most important HIPAA compliance deadlines are behind them, although

doctors at his hospital will use an identity management system from Oracle. It will allow physicians to use a single sign-on to gain access to several hospital systems; it will also provide clearer auditing and tracking to see who has used the systems.

The EMR and other in-process systems for computerized physician order entry and electronic medication administration records will come online later in the year. “We hope to be 100 percent HIPAA-compliant sometime in 2007,” says Uno.

Despite the financial burden of working to comply with HIPAA, Uno says, the alternative—exposure of patient data—could spell disaster. “With regards to healthcare privacy,” he says, “no one wants to be in the spotlight.” **CIO**

Susannah Patton is a California-based freelancer. To comment on this article, go to the online version at www.cio.com/101506.

Handling HIPAA

For best practices, read “EIGHT (NOT SO) SIMPLE STEPS TO THE HIPAA FINISH LINE” at www.cio.com/070103, and “HOW TO MEET TOMORROW’S PRIVACY RULES TODAY” at www.cio.com/110102.

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In the past six years, **Kevin Turner** has occupied three of the most senior offices in the corporate C-suite: CIO, CEO and COO. He talks about what's different and what's the same, and shares the secrets of his success.

How to Succeed in Business

CIOs TODAY HAVE MORE OPPORTUNITIES THAN EVER TO move out of IT and into other C-suite positions, including that of CEO. Yet many IT executives worry that they lack the knowledge and leadership skills to achieve success in a new setting.

Not so for Kevin Turner. His career could serve as a how-to for CIOs who are aiming for the corporate ladder's highest rungs. Turner became CIO at Wal-Mart, one of the world's largest companies and most successful users of IT, at 34. At 37, he was promoted to run Sam's Clubs as its president and CEO, with more than 46 million members and \$37.1 billion in annual sales. Last year, at the age of 40, he left the company where he'd spent his career to become COO at Microsoft. There he leads a global organization of more than 32,000 employees, including field sales and marketing professionals who delivered more than \$40 billion in revenue during fiscal 2005. As COO, he is responsible for product and customer support services, branding, advertising, public relations, market research and relationship marketing. He also oversees corporate operations and internal information technology that supports the work of 71,000 employees worldwide. Turner serves on the senior leadership team that sets Microsoft's strategy and direction.

He spoke with *CIO* Editor in Chief Abbie Lundberg during a recent visit to Microsoft headquarters in Redmond, Wash.

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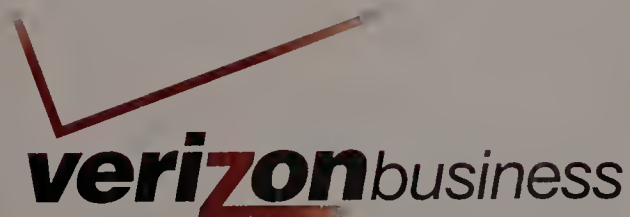
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“The CEO role has a lot of external complexities. But the CIO has some moments that would be very comparable to the most difficult day of the CEO.” —Kevin Turner, Microsoft COO

CIO: When you were Wal-Mart's CIO, what were the three most important things you did to prepare yourself for a broader role in the business?

Kevin Turner: When you're in a company that believes in the value of IT and where there are high expectations on the delivery of that value to the business, the ability to work with people and teams [is critical. You need to be able to] pull together a focused agenda with clear definitions of success. So building self-managed, high-performing teams in IT was a necessity that proved very useful on the business side.

Next would be building relationships with peers in the business group. When you work closely with people to deliver results, audit the payback, review what's been implemented and come up with a mechanism to drive improvement, it gives you a good understanding at a high level of how the company or the operation works. That became something I relied heavily upon in my next role [as CEO of Sam's Clubs]. Finally, an understanding of what's possible with technology and the ability to map it to business problems and solutions to drive results [is critical]. Applying that knowledge in the business role was instrumental for me.

What it takes to be a successful CIO sounds similar to what it takes to be successful moving into that broader business role.

You have to tailor your terminology and your approach, but the principles are solid and they very much transport.

Has technology hit a tipping point in terms of its relevance and importance to the business?

I think so. In the early '90s, I would have characterized the CIO grade card [this way]: being under budget, enabling the

company to grow and keeping the systems running. Those were the main drivers that could get you a decent grade as a CIO.

You still have to do those things. But now the world-class companies are saying, “How can IT really help us change the world? How can IT help me change my business model and change our game against the competition?” That's the biggest fundamental shift.

Wal-Mart was perhaps on the front side of that change. It is in a very low-margin business [where you have to make] sure that every dollar spent is accounted for and that we got the payback out of it. I had a lot of help from senior management to say whether we got what we said we'd get, and if not, why? Was it a bad decision, or was it something that we simply didn't execute as well as we should have? Having that follow-up was important.

Of the positions you've had since being a CIO—COO and CEO—which is the more natural next step for an IT executive?

The CIO could graduate into either of those roles, or head of a division or head of procurement or marketing, depending upon the operation. The sophistication of what's required [to run a business] is escalating like crazy. Staying on top of that is something CIOs are used to doing. They're used to a lot of change coming their way. That dynamic environment really puts them at an advantage as they go into the business.

Which is the harder job: CIO or CEO?

Well, it depends upon the amount of change

you're trying to introduce and the results that you're up against. They both have their moments. With everything the CEO faces today from the standpoints of governance, competition and shareholder expectation—let's just say there's less under your direct control than with the CIO role. The CEO role has a lot of external complexities. But the CIO has some moments that would be very comparable to the most difficult day of the CEO.

Why did you leave Wal-Mart after almost 20 years?

It's an interesting story. My relationship with Microsoft went back 14 years with Steve Ballmer. I worked directly and indirectly with him during my time in Wal-Mart's IT department, then when I was CIO, and after I moved into the business.

Being at one highly successful company and making the transition to another was, with the exception of marrying my wife, the greatest single decision I ever made. It was a great chance for me to get back to technology, which is what I loved, but it was also a great opportunity to learn from another successful company. If I hadn't moved [to Microsoft], I probably would have finished my career [at Wal-Mart].

What advice would you give CIOs who are ready to move to a different role?

Take inventory of what you've been exposed to and learned. Make sure you have an understanding of how the business operates, the external marketplace and how the customer responds. And remember: Creating and driving business value is really meaningful to taking that next step. **CIO**

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Business Technology Leadership

endlines

BY SCOTT KIRSNER

I.T. MVPs

Trade 'Em With Your Friends

As the World Series approaches, we find ourselves wondering: Don't the highly paid, hard-hitting, eagle-eyed MVPs of IT deserve their own trading cards, too? To rectify that situation, we created five. (Sadly, we weren't able to persuade CIO's publisher to slip a thin slab of petrified pink gum into these pages to accompany them.)

Mandy "The IT Whisperer" Pepperidge

User Support Specialist
Indomitable Financial Services
Ht: 5'7" Wt: 140 Types: 115 wpm
Born: 8-30-76 Hometown: Detroit



No matter how idiotic the question ("Which key is the Any key?"), Pepperidge stays cool as a cuke, rarely relying on the tech support specialist's all-purpose response: "Didn't you read the freakin' manual?" Once revived a dead laptop battery with nothing more than a laying on of hands.

DHDR (Deleted Hard Drives Recovered) Percentage: 78%

Average travel time to CEO's office: 1 min., 17 sec.

Software upgrades installed in one day (personal best): 43

Vernon "Big Data" Wormer

CIO
Faber Utilities
Ht: 4'11" Wt: 144
Types: "My admin is quite fast."
Born: 1-25-55
Hometown: Kansas City, Mo.



Vendors and CFOs alike cower when forced to face Wormer across a conference table; his per-seat license fees inevitably plummet as his budget grows. Rare stumble: In delivering a motivational speech to the development center in Bangalore, his attempt to say "we're all on the same team" in Hindi translated into "your mother smells like goat cheese."

Months to achieve Sarbox compliance: 3

Trademark cliché: "At the end of the day..."

Donald "The Provider" Schoenstein

Project Manager
The Reptile Enthusiast's Catalog
Ht: 6'1" Wt: 210 Types: 88 wpm
Born: 6-22-63 Hometown: Pocatello, Idaho



Wherever there's a developer dozing during a late-night coding session, or a teammate blathering in front of a PowerPoint presentation, "The Provider" is there, delivering pork rinds and Mountain Dew, or cutting things off after Slide No. 94. Revered for delivering a new call center software module on Thanksgiving Day—seven weeks ahead of schedule.

Gantt chart deadlines met: 99.6%

Record number of encouraging e-mails sent to team (one day): 29

John "Mad Dog" Blutarsky

Network Administrator
Hardin Software
Ht: 5'7" Wt: 155
Types: 38 wpm Born: 3-14-70
Hometown: Deerfield Beach, Fla.



Allegations of steroid use emerged when Blutarsky pulled 3,500 feet of Cat 5 cable through the ceiling in one day—but nothing was ever substantiated. Nor was it ever proved that Blutarsky was renting out the company's networking closets as housing for college students. (Blutarsky said the Craigslist postings were "a joke.")

IP addresses memorized: 89

Hacks thwarted: 342 (self-reported)

Employees outed for surfing inappropriate sites during work hours: 22 (but you're on warning, Dorfmann!)



Clorette "Bunny" DePasto

Software Developer
Bargain Mart Discount Stores
Ht: 5'11" Wt: 160 Types: 195 wpm
(aided by custom-crafted AI software)
Born: 8-14-78 Hometown: Houston



DePasto once ignited a cubicle-clearing brawl by asserting that *The Matrix* contains better special effects than the *Lord of the Rings*. Has never been seen in the office before noon, or consuming a beverage other than Red Bull.

Bugs (introduced by other programmers) eradicated, one hour: 41

Job offers received from rival companies, daily: 7 (average)

Comments written to explain flawless code: 0 (lifetime)

Sony recommends Windows® XP Professional.

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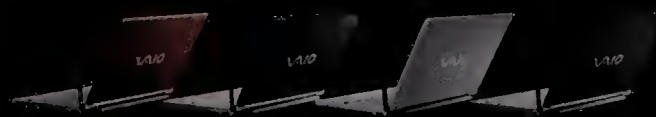
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Sprint



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